

Research Application Summary

Characterization of fish markets for small-scale farmers in Kenya

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Abstract

A study was done to determine the characteristics of fish markets for small-scale fish farmers in four Counties in Kenya, namely, Kirinyaga, Busia, Kakamega and Migori. The objectives of the study were to i) assess the social-economic characteristics of fish farmers, ii) determine the main factors that influenced fish markets and iii) evaluate the main production and marketing challenges. Participants in the study were selected from active fish farmers, traders and consumers through stratified purposive sampling. During sampling, care was taken to include women fish farmers who practiced fish farming individually or in groups. Data were collected using semi-structured questionnaires for each group of participants. Global Positioning System (GPS) co-ordinates were taken for all areas visited in the study. Most of the fish farmers were 40 – 60 years old and had only attained a primary level of education. Majority of farmers in Kirinyaga County stocked mixed sex tilapia, while all stocked male tilapia in Kakamega and Busia. In Migori, farmers stocked either all male or mixed sexes. Fish took between 8 – 9 months to attain an average weight of 280 grams. The most important market outlets for farmed fish were neighbours, friends, relatives and other social networks at the pond site. Most farmers preferred wild to farmed fish. The most popular product transformation activities were descaling and gutting.

Key words: Busia, fish markets, gender, Kakamega, Kirinyaga, Migori, tilapia, value addition

Résumé

Une étude fut réalisée pour déterminer les caractéristiques des marchés aux poissons pour les petits exploitants piscicoles de quatre comtés du Kenya : Kirinyaga, Busia, Kakamega et Migori. Les objectifs de la présente étude étaient i) d'évaluer les caractéristiques socio-économiques des pisciculteurs, ii) de déterminer les principaux facteurs qui influençaient le marché des poissons et iii) d'évaluer les principaux défis de production et de commercialisation. Les participants à l'étude ont été sélectionnés parmi les pisciculteurs, les commerçants et les consommateurs en activité par un échantillonnage stratifié ciblé, au cours duquel, des précautions ont été prises pour inclure les pisciculteurs qui pratiquaient la pisciculture individuellement ou en groupe. Les données ont été collectées à l'aide de questionnaires semi-structurés pour chaque groupe de participants. Les

coordonnées de toutes les zones visitées pendant l'étude ont été prises à l'aide du GPS. La plupart des pisciculteurs avaient entre 40 et 60 ans et n'avaient atteint que le niveau d'éducation primaire. La majorité des pisciculteurs du comté de Kirinyaga font un mélange de sexe pour le tilapia, alors que tous font du tilapia mâle à Kakamega et Busia. À Migori, les pisciculteurs font soit le tilapia mâle ou en mélange avec la femelle. Les poissons mettent environ 8 à 9 mois pour atteindre un poids moyen de 280 grammes. Les débouchés les plus importants pour les poissons étaient les zones environnantes, les amis, les proches et autres réseaux sociaux sur les sites des étangs. La plupart des agriculteurs préféraient le poisson sauvage au poisson d'élevage. Les activités populaires de transformation de produits étaient le détartrage et l'éviscération.

Mots clés: Busia, marchés aux poissons, genre, Kakamega, Kirinyaga, Migori, tilapia, valeur ajoutée

Background

In Kenya, aquaculture was popularized through the Fish Farming Enterprise and Productivity Programme which was implemented between the years 2009 to 2013. Under this programme, fish farming was funded in 160 political constituencies (KMFRI, 2017). In each of these constituencies, farmers received funds for construction of ponds, provision of fingerlings and feeds, supply of harvesting nets, training, provision of market infrastructure, and provision of on-farm feed mixing and pelletizing machines. Fish processing infrastructure was built in four counties namely: Migori, Kakamega, Nyeri and Meru. The total installed capacity of these processors is approximately 3000 tons/year (KMFRI, 2017) but current production is below this installed capacity. Despite this massive government investment in fish farming, there are still several key challenges and among them is the low volume of fish produced and challenges associated with marketing of farmed fish by small-scale farmers. This study was done to evaluate production and marketing characteristics of farmed fish for small-scale producers in Kenya. The specific objectives of the study were to and identify the key social economic and other factors that influence production of farmed fish, determine the challenges to production, and evaluate the main factors that influence marketing of farmed fish among small-scale farmers in Kenya.

Materials and Methods

Study area. The study was done in four counties in Kenya, namely: Kirinyaga (Central Kenya), Busia and Kakamega (Western Kenya) and Migori (Lake region). All the areas selected for this study have a high potential for production of farmed fish and were all covered under the Fish Farming Enterprise and Productivity project. In addition, in all these Counties, women fish farmers were supported by the Kenya Women Holdings through provision of loans and capacity building in fish farming.

Sampling procedure. Participants were selected from active fish farmers in the selected areas. The selection was based on stratified purposive sampling where respondents were selected from sub-counties representing areas where fish farming was practiced. Within these sub-counties, care was taken to include both men and women fish farmers who did

fish farming individually or in groups. Information was collected from 321 fish farmers, 66 fish traders and 82 consumers. Secondary data were collected using documents from County Directors of Fisheries and Fisheries Extension officers.

Data collection and analysis. Data were collected using semi-structured questionnaires for each group of participants. Global Positioning System (GPS) co-ordinates were taken for each homestead included in the study. Secondary data were collected using documents from the Department of Fisheries in Nairobi and from County Directors of Fisheries and Fisheries Extension officers. Key informant interviews were done with County directors of fisheries, fisheries officers and leaders of fish farming clusters, among others.

Questionnaires were checked for correctness and obvious errors. Data were then cleaned, edited, sorted and entered into the computer spreadsheet. Descriptive statistics consisting of frequencies, means and modes were computed for different data categories to facilitate comparisons. Statistical Package for Social Sciences (SPSS version 19.0) was used for analysis.

Results and discussion

In all the Counties, most households (over 85%) were headed by men. Only 11-15% were female headed. Majority of house-hold heads were aged between 41 and 60 years. Migori County had the highest percentage of young house-hold heads (20 – 30 years) compared to other counties. Gender influenced the level of education where majority of women (53.3%) had only attained pre-primary level of education. In all counties except Kakamega, no woman had attained University education. The level of education of farmers influences the adoption of farming technologies. Studies by Kimenye (2001) showed that formal education was positively correlated to the probability to adopt farming technologies.

Majority of the fish farmers sampled in Kirinyaga stocked mixed sex tilapia (57.1%), while farmers in Kakamega and Busia stocked mono-sex tilapia. In Migori, 45% and 47% of farmers stocked mixed sex and mono-sex tilapia, respectively. Very few farmers kept catfish in the study area.

The major challenge reported by most fish farmers was the high price of fish feeds. This was reported by 29.8 % and 28.9% of farmers in Busia and Kirinyaga, respectively, and 24% and 20.3% of farmers in Kakamega and Migori Counties, respectively. Farmers reported that feeds were very expensive, not easily available and of low quality. The second challenge reported was destruction of fish by predators, followed by lack of markets and theft.

On average, tilapia took between 8 - 9 months before they were harvested. This means that only one cycle of fish could be produced per year, thus limiting the size of market for farmed fish. Growth of tilapia fish is mostly influenced by water temperature and pond depth (El Sayed *et al.*, 1996), feed management (Poumogne and Ombredane, 2015) and dissolved oxygen (Mohsen *et al.*, 2014). In studies on semi-intensive systems, tilapia took on average 6 - 7 months to grow to a weight of 250 grams.

Most farmers did not weigh their fish and used size as a determinant of pricing. The highest number

of farmers who weighed fish was in Kirinyaga (67.2 %) while Migori County had the least number of farmers weighing fish (15.9%). In Kakamega and Busia, 40% and 28% of the farmers, respectively weighed fish before selling.

The number of fish harvested determines the size of the fish market. Generally, most farmers stocked 1000 fingerlings in a pond measuring 300 m² giving rise to a stocking density of 3.3 fish per square metre. This was the stocking density recommended under the Fish Farming Enterprise and Productivity Project funded under the Economic Stimulus Program. The highest number of fish were harvested in Kakamega (662.4 pieces), followed by Migori (636 pieces) and Busia (595.4 pieces) and Kirinyaga, (192.8 pieces of fish), respectively.

The main markets for farmed fish are shown in Table 1. The most important market for the harvested fish in all the Counties sampled was neighbours, friends and relatives and other social networks at the pond site. Most farmers complained that in this type of marketing, prices offered for fish were low, and in some cases, they were compelled to sell on credit terms. The other important markets were traders who bought fish at the pond, while other fish were delivered to markets. In all Counties, only a small percentage of fish were delivered to a collection point. There was no organized marketing as most farmers sold fish as they matured.

Value addition included any activity that improved on the existing products. The most popular product transformation activity carried out was de-scaling and gutting, which was done by majority of farmers sampled in Busia (38.5%), Kirinyaga 72.7 %) and Kakamega (80.4%), respectively. Most of the farmers sampled in Migori did not do any processing before selling.

Table 1. Market outlets for farmed fish

Selling point	Busia (%)	Kakamega (%)	Kirinyaga (%)	Migori (%)
Neighbours and friends	34.5	35.0	40.4	33.6
Traders at the pond	25.9	29.2	31.9	31.1
Delivered to the market	25.3	20.4	13.8	20.5
Delivered to the collection point	14.4	15.3	13.8	14.8

Conclusions

Fish took an average of 9 months before they matured, which meant that there was only one production cycle per year. In order to access bigger and more lucrative markets, regionally and globally, there is need to increase production and the size of fish produced because that would facilitates value addition such as processing, filleting and smoking to some extent. Fish markets were unstructured and not disorganized. For most farmers, the markets consisted of social networks such as family, neighbours and friends who bought fish at the pond site on the day of harvesting. The most common value addition done on harvested

fish was descaling and gutting. In some Counties such as Busia, this was done by farmers as a service to people who purchased fish, and did not necessarily lead to price increases. In Kakamega and Kirinyaga, descaled and degutted fish fetched a higher price than whole fish which was not processed.

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