

TOPIC AREA

MARKETING, ECONOMIC RISK ASSESSMENT, AND TRADE



ENHANCING THE FUNCTIONALITY AND APPLICABILITY OF FISH MARKET INFORMATION SYSTEM (FMIS) TO MARINE ARTISANAL FISHERIES IN GHANA

AFRICA PROJECT: GHANA & TANZANIA

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Objectives

1. Broaden the applicability of existing FMIS to include the marine artisanal fisheries subsector.
2. Expand the functionality of the FMIS by customizing market price collection procedures to enable accurate and real time data collection.
3. Train marine artisanal fishermen on the use of the FMIS.

Significance

During the 2013-2015 funding cycle, AquaFish Innovation Lab funded an investigation that developed a cell-phone based Fish Market Information System (FMIS) with a focus on tilapia and catfish in Ghana. This is because tilapia and catfish are the dominant fish species that are farmed and caught in inland waters. The FMIS has a database of current farm-gate and market prices of the two species in selected locations in Ghana assembled by fisheries officers and selected agents. The FMIS is web-based and provides market information on the two species on-line as well as via voice and SMS/text messaging to users. There are two types of subscribers to the system – registered users and ad-hoc users. The system can send out (push) farm-gate and market price information to only the registered users. However, to request (pull) information on tilapia prices from the system, both registered users and ad-hoc users can access the system either by dialing or SMS/text messaging to a 10-digit phone number or a 4-digit short code. The voice feature of the system when a user requests for information includes messages in English and three native languages – Twi, Ga and Ewe.

AquaFish CRSP and AquaFish Innovation Lab activities in Ghana over the years have addressed only aquaculture issues and not the capture fisheries sector. This investigation seeks to address the biased focus on aquaculture as the artisanal fisheries sector contributes significantly to seafood supply in Ghana. AquaFish Innovation has also funded a cell-phone based project in Uganda, that developed baseline information about the needs and interest of fish farmers that could be used by public agencies, NGOs, and cellular providers to develop services for fish farmers. In Kenya, the Kenya Marine and Fisheries Research Institute's (KMFRI) Enhanced Fish Marketing Information System (EFMIS) was piloted with a select group of fish farmers. Fish farmers were trained to query the EFMIS database to enable them become familiar with how the system worked, i.e., how to access Lake Victoria's fish landing

information. This investigation will leverage the knowledge gained from the AquaFish funded Uganda and Kenya projects through collaborative work so that the countries can learn from one another in the development of this technology for the aquaculture sector. If well developed and implemented, the cell phone technology can improve the livelihoods of fish farmers and agents along the fish value chain by narrowing market information gaps and improving networking along the chain. With improved communication along the fish value chain, there would be better market efficiencies and reduction in transaction costs. This would result in improved incomes and household purchasing power for fish farmers and fish retailers. With more incomes, these households can afford to buy more nutritious foods to improve household health.

The UN Millennium project included eight development goals that committed nations to global partnerships to reduce all aspects of extreme poverty including income poverty, hunger, disease, lack of adequate shelter, and exclusion, while promoting gender equality, education, and environmental sustainability. Though the Millennium Development Goals (MDGs) do not make specific reference to fisheries and aquaculture development, those sectors are targets for development to alleviate hunger (MDG #1) and address environmental sustainability issues (MDG #7).

There are two capture fishery sectors in Ghana: marine (sea and lagoons) and inland (lakes, rivers and reservoirs). The marine fishing industry has three main sectors: Artisanal or small scale, semi-industrial or inshore, and industrial subsectors. The artisanal fisheries sector is the most important in terms of landings and contributes approximately 80% of the total marine fish production (Mensah & Antwi, 2002; Amador et al., 2006). The artisanal fisheries sector is reported to employ about 20% of the nation's labor force, or about 2 million people (Atta-Mills et al., 2004). It is estimated that the marine fishery sector accounts for about 3.9% of Ghana's gross domestic product (GDP) and 11% of the Agriculture GDP (Bank of Ghana, 2008). The total landings from inland fisheries constitute approximately 10% of the total national landings of capture fisheries, with the remainder coming from the marine fisheries. The inland fisheries are all artisanal operating from about 1,232 fishing villages along the shores of the Volta Lake (Braithwaite, 2003).

The artisanal fishery plays an important role to coastal communities by providing employment, revenue, and a resource for food. It contributes to the national economy in terms of food security, employment, poverty reduction, GDP and foreign exchange earnings. However, the artisanal fisheries are confronted with challenges, which includes high post-harvest losses and handling costs as well as low economic returns and low value addition (Aheto et al., 2012; Mills et al., 2012; Mensah & Antwi, 2002). Artisanal fishers are dependent solely on inland and marine resources and their contribution to the national food system will require appropriate investments in developing the seafood value chain to reduce the waste, enhance efficiency, and strengthen value addition. Therefore, broadening the applicability of the existing FMIS to include the marine artisanal fisheries subsector will go a long way to improving the welfare of artisanal fishermen through a reduction in transaction costs and improvement in the benefits from fish trade.

The FMIS at this stage is a pilot technology that functions with a focus on tilapia and catfish. The services it provides help to address market information asymmetries between buyers and sellers of tilapia and catfish, and is helping to improve the bargaining power of smallholder fish farmers/fishers in their interactions with fish traders. The system is enhancing the efficiency of input use and increasing the size of the average fish by delivering concrete suggestions and market information through mobile messaging. These benefits are lacking in the marine artisanal fisheries subsector though fish from capture fisheries form part of the whole seafood value chain in Ghana. In addition, it is important to find ways that best allows the benefits of the system to reach many more stakeholders and general fish consumers.

This investigation will expand the functionality of the current FMIS with more value chain services to include prices of inputs, prices of marine species at selected landing sites, and access of the system to consumers. By providing farmers easy access to information on fingerling and feed prices and where to buy them further empowers them to farm efficiently. Allowing consumers of fish access to market prices will further close the gap between what farmers are making and what consumers are paying. The FMIS thus creates an enabling environment where stakeholders in the fish value chain are better informed. The improved system will help fish farmers/fishers, fish processors and traders to more efficiently support urban markets with seafood products. In addition, the improved FMIS will have applicability to the marine artisanal fisheries subsector from fish trade.

Quantifiable Anticipated Benefits

1. A Market Information System that organizes market prices of seven major seafood species in Ghana and serves as a resource for the development of marketing plans and strategies.
2. Access to sufficient seafood market information that is needed for informed market and policy decisions.
3. Database assembled over a period of time will be available to US researchers for any quantitative analysis of the seafood market in Ghana.
4. An information system that can be expanded into a portfolio of agricultural-based and non-agricultural rural enterprises.

Research Design and Activity Plan

Methods

Objective 1: Broaden the applicability of existing FMIS to include the marine artisanal fisheries subsector.

The current market information system in Ghana focuses on only tilapia and catfish prices from different supply points and markets. The marine species that dominate fish catch landed are sardinellas, anchovies, mackerels, red fish, and tuna (Aheto et al., 2012; Amador et al., 2006). **Farmerline** will provide additional programming to broaden the applicability which allows marine artisanal fishermen to obtain market prices for 5 major marine and species (Tuna, Dentex [Redfish], Mackerel, Sardinellas, and Caranx) landed in the major markets via voice and SMS/text messaging. Artisanal fishermen will register with the system and can request the market information through a short code. Fisheries officers and agents will be recruited to visit selected landing sites the coastal regions of Ghana as well as major retail markets weekly to obtain prices. Preliminary discussions have taken place with the Ministry of Fisheries and Aquaculture Development (MFAD) on providing assistance through the fisheries officers. FarmerLine also has field officers who will assist with the collection of market prices. A weighted average weekly price will then be calculated and made available to users.

Objective 2: Expand the functionality of the FMIS by customizing market price collection procedure to enable accurate and real time data collection.

Farmerline will provide the services of additional programming to further improve the quality and timeliness of data collected through customization of the MERGDATA platform. The data collection process will be complemented with crowd-sourced information from consumers selected randomly to provide vital feedback on the validity of the prices being received. Thus, there will be new partnerships and expanded scope of engagement with information assembled in the FMIS database. The enhanced FMIS would provide more accurate and timely market information.

Objective 3: Train artisanal fishermen on the use of the Seafood Market Information System.

Two landing sites along the coast, one each in the Greater Accra region and Central region, will be identified as a venue for training. The training activities will be conducted in collaboration with the MFAD, chief fishermen, and elders in the selected fishing communities. The workshops will be

publicized through the MFAD and by word-of-mouth in the coastal communities. Regional and District fisheries officers will be involved in the training of the artisanal fishermen.

Trainings and Deliverables

1. Two training programs on how to use mobile phones to receive information on seafood prices and other market data will be offered to artisanal fishermen one each in the Greater Accra region and Central region. It is anticipated that there will be 50 participants at each of the training sessions (total of 100).
2. A database of seven major seafood prices and other market information – Tilapia, African catfish, Tuna, Dentex (Redfish), Mackerel, Sardinellas, and Caranx.
3. An electronic forum for users of FMIS that enhances seafood market activities for small-scale fish farmers, artisanal fishermen, fish retailers and consumers.

Beneficiaries

Fish farmers, artisanal fishermen, fish processors, seafood traders and retailers, consumers, and policy makers.

Future Plans

The plan is to get as many users as possible for the enhanced FMIS. A high patronage of the system makes a pay-per-use more feasible. Widening the scope of information and services available on the FMIS platform will expand usage by many more stakeholders that will include fish farmers, artisanal fishermen, fish processors, seafood traders and retailers, consumers, and policy makers, etc., which then allows for maximum impact through scale and sustainability. The benefits shown to stakeholders using the information will motivate stakeholders to pay, which allows for further development of the system to fit the needs of users. Charges for usage will take into account the cost of system maintenance and programming support. Pricing arrangements will be made with mobile phone companies for long-term financial sustainability of the system.

Schedule

Renew / Amend subcontracts with KNUST and <i>Farmeline</i>	August – October 2016
Additional Programming of the electronic information platform	November 2016 – March 2017
Data and information collection from landing sites and market centers in the coastal regions.	April – June 2017
Field testing of the enhanced FMIS	July – August 2017
Training marine artisanal fishermen in the use of FMIS	September – December 2017
Reporting	January – February 2018