

Research and Technology Innovations in Mobile Phone-based Fish Information Systems in Ghana, Kenya, and Uganda

Kathryn Goetting*, Jenna Borberg, Ford Evans, and Hillary Egna

AquaFish Innovation Lab, Oregon State University, Corvallis, Oregon, USA | aquafish@oregonstate.edu | aquafish.oregonstate.edu

Introduction

In Africa, mobile phones are widely available, with 65% of Ugandans, 82% of Kenyans, and 83% of Ghanaians owning mobile phones (Pew 2015). The prevalence of mobile phones facilitates rapid transfer of information among and between individuals, the private sector, and government.

For small-scale aquaculture in Africa, challenges limiting growth of the sector result from inadequacies in the flow of information along the fish value chain. Mobile phone technologies have great potential to help improve information flow and market asymmetries between buyers and sellers of fish products and may particularly benefit smallholder fish farmers. The AquaFish Innovation Lab has partnered with researchers in Kenya, Ghana, and Uganda to develop mobile-based support systems to advance information transfer on aquaculture production, marketing, and sales.



Goals

- Increase fish yield and quality through information transfer to fish producers on best production practices.
- Improve income generation throughout the value chain by empowering participants with current market prices and connecting buyers and sellers.
- Reduce post-harvest loss by improving information flow between buyers and sellers.

Accomplishments

- Engaged and strengthened partnerships with local producers, researchers, industry.
- Created mobile systems that provide up-to-date market information.
- Established systems serve as repositories of fish market data and as a resource for farmers to build capacity and make better informed business decisions.



Challenges

- Accessibility: Short-code enables cell-based systems to be more broadly used; however, it is expensive to obtain and requires technical expertise.
- Longevity: Maintaining a mobile system requires resources to cover costs of the software platform and to provide accurate and current content. Therefore, government support, grants, or subscribers are needed for long-term success.
- Effectiveness: The effectiveness and power of the mobile systems will result from large networks of subscribers throughout the aquaculture value chain, making dissemination and marketing important components of this work.

Kenya

In Kenya, AquaFish researchers evaluated the feasibility of integrating a farmed fish marketing database into an existing network, called the Enhanced Fish Marketing Information System (EFMIS), which provides market information to the capture fisheries sector.



Tool Development

Initiated in 2009, the EFMIS is a joint effort between the Kenya Marine and Fisheries Research Institute and the International Labour Organization. AquaFish researchers conducted a pilot study and a workshop to train fish farmers on EFMIS and determined that creating a system for synthesizing daily market information on farmed fish to end-users would bolster the aquaculture sector in Kenya.

Status and Next Steps

- EFMIS has made significant progress in expanding the flow of information along the fisheries value chain in Kenya by establishing a market data and information collection service, creating a mobile system with up-to-date market, and maintaining a repository of critical fisheries market data.
- Market information is available for more than 150 landing sites on Lake Victoria. Demand for services has grown rapidly among end-users throughout the region.
- Researchers hope to integrate market prices and data for farmed fish alongside the capture fisheries market data that is currently curated and distributed through the EFMIS, further extending the benefits of this system to fish farmers throughout the country.



Ghana

AquaFish researchers from Purdue University (USA) and Ghana's Kwame Nkrumah University of Science and Technology (KNUST) developed a service called the Seafood Market Information System (SMIS), a web-based tool that provides tilapia market information online as well as via voice and text messaging.



Tool Development

Initiated in 2013, AquaFish researchers collaborated with officers from the Ghana Fisheries Commission and a local programming company, Farmerline, to create a central database hosted by researchers at KNUST. Fisheries officers populate the database with tilapia sale prices provided the farms (farm-gate pricing) and market data for tilapia from several locations throughout the country. Data can be entered and uploaded using mobile devices providing data collectors quick and easy access. Once new information is uploaded, the system then distributes these data in near real-time to registered and ad-hoc users.

Status and Next Steps

- The marketing system offers a central location to enter and store tilapia market data and serves as a resource for farmers to build capacity and make better informed business decisions.
- AquaFish researchers are expanding the scope of SMIS to include marine fisheries. They are building the database to reflect market information relevant to seven major fish markets, including tilapia, African catfish, tuna, dentex (redfish) mackerel, sardinellas (sardine, herring, shad, and menhaden), and caranx (jack and kingfish).
- Preliminary data show more than 320 registered users. By project's end in 2018, researchers predict that number to increase substantially to approximately 5,000 users.



Uganda

AquaFish researchers from Auburn University (USA) and Uganda's National Fisheries Resources Research Institute (NAFIRRI) and Makerere University are developing a mobile application to provide market information to fish producers, connect buyers and sellers, and to train producers on best practices.

Tool Development

AquaFish researchers initiated a pilot study in Uganda in 2013 to evaluate the feasibility for establishing a mobile-phone network for providing technical guidance, extension services, and market data for the aquaculture sector. Over 100 individuals in Gulu, Jinja, and Kajjansi were engaged in the evaluation. In response to findings, AquaFish partnered with Likamis Software Limited to develop aquaculture training modules to address technical needs, provide market information with current market prices, and connect farmers with buyers through Agro Market Day's mobile application.

An automatch algorithm populates market prices and connects buyers and sellers. Eight technical modules (site selection, pond construction, water management, stocking, sampling, feeding, harvesting, and disease) are being built for both smart phones and basic, text-based phones and content has been translated into 5 languages: English, Luganda, Lunyankore, Ateso, and Acholi. The content provided by Auburn University and NaFFIRI is being reviewed and tested by scientists, extension agents, and students.



Status and Next Steps

- The application is being tested by extension agents, students, and end users in three regions in Uganda – central, east, and north, as well as with the women's fish farmer network near Kampala.
- The application is being disseminated widely with farmers and the broader community at the annual Fish Farmer Agriculture Show in Jinja in September 2017. The project team also partners with farmer groups, buyers, input companies, consultants, organizations, and training institutions to further disseminate the product.
- The content will be revised based on testing results, and the application's anticipated launch is Fall of 2017.



Acknowledgement

The Feed the Future Innovation Lab for Collaborative Research on Aquaculture & Fisheries (AquaFish Innovation Lab) is funded under USAID Leader with Associates Cooperative Agreement No. EPP-A-00-06-00012-00 and by participating US and Host Country partners. This work was made possible by the generous support of the American people through USAID. The contents are the responsibility of the authors and do not necessarily reflect the views of USAID or the United States Government.

The authors gratefully acknowledge Amanda Hyman for poster layout and design. All photos and illustrations courtesy of AquaFish Innovation Lab.

World Aquaculture Society
Cape Town, South Africa
June 2017

