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

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Introduction

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

For small-scale aquaculture in Africa, many of the challenges limiting growth of the sector result from inadequacies in the flow of information along the fish value chain. Cell 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. 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.

Common 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.

Common Accomplishments

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

Common 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, therefore dissemination and marketing are important components of this work.

Kenya

In Kenya, AquaFish researchers evaluated the feasibility of building 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 with up-to-date market, and creating and maintaining a repository of critical fisheries market data.
- Market information is available for more than 150 landing sites on Lake Victoria, and 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 Kwame Nkrumah University of Science and Technology (KNUST) in Ghana, 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 the prices at which tilapia are sold by 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. This method of linking fish farmers and fishers has potential to be very effective in Ghana as the use of mobile phone technology increases.

Status and Next Steps

- The marketing system offers a central location to enter and store tilapia market data and serve 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 and building the database to reflect market information relevant to seven major fish market, including tilapia, African catfish, tuna, dentex (redfish) mackerel, sardinellas (sardines, herrings, shads, and menhadens), and caranx (jacks and kingfishes).
- 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.
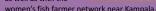

Uganda

AquaFish researchers from Auburn University, USA, and National Fisheries Resources Research Institute (NAFIRRI) and Makerere University in Uganda, 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 (Agromarket Day) to develop a mobile application containing aquaculture training modules to address technical needs, market information with current market prices, and to connect farmers with buyers.

An auto match 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. Auburn University and NaFFIRI provided content, and it 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 company, consultants, organizations, and training institutions to further disseminate the product.
- The software developer will revise content based on testing results and the application's anticipated launch is Fall of 2017.