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FACT SHEET
Improving Biosecurity: A Science-Based Approach to Manage Fish Disease Risks and Increase the Socioeconomic Contribution of the Nigerian Catfish and Tilapia Industries

WorldFish

Introduction and purpose

Nigeria is one of Africa's largest aquaculture producers, yet its lack of a clear aquatic animal health strategy has resulted in substantial disease-related production losses. There is little or no biosecurity management practiced at the production level, except for a few large-scale commercial farms.

Improving Biosecurity: A Science-Based Approach to Manage Fish Disease Risks and Increase the Socioeconomic Contribution of the Nigerian Catfish and Tilapia Industries is a 3-year Feed the Future Innovation Lab for Fish project led by WorldFish headquarters in Malaysia, together with its implementing partners Mississippi State University (MSU) and the University of Ibadan (UI).

Strategies will be developed to reduce the risk of diseases in catfish and tilapia, two major farmed species in Nigeria. To maximize data collection and quality over time, the project focuses on a small-scale regional model, covering different farming systems on a limited number of farms spread over a restricted geographical zone. The model will be refined over 24 months and replicated with the national competent authority (CA) and partners for future scaling into state and national schemes. This will involve capacity development, innovation, and establishing strong international and national partnerships. Reducing the risk of disease will increase production and income, which will eventually benefit thousands of Nigerians relying on fish farming for their livelihoods and will increase fish availability for human consumption.

Objectives

1. To understand the epidemiology and health economics of catfish and tilapia from hatchery seed production to the grow-out phase in Nigeria's Ogun and Delta states.
2. To understand the health status of catfish and tilapia in a regional model, using syndromic and laboratory diagnostics.
3. To identify pathogens of economic significance circulating in Nigerian catfish and tilapia aquaculture, using whole genome sequencing and molecular tools.
4. To develop better management practices (BMPs) and build capacity to reduce the risk of disease outbreaks in catfish and tilapia aquaculture in Nigeria.
5. To develop science-based policies and strategies for reducing fish disease risks in Nigerian aquaculture for long-term development beyond the 3 years of the project.

Nigeria

Ogun State

Delta State

Project
Improving Biosecurity: A Science-Based Approach to Manage Fish Disease Risks and Increase the Socioeconomic Contribution of the Nigerian Catfish and Tilapia Industries

Donor
United States Agency for International Development through the Feed the Future Innovation Lab for Fish

Partners
WorldFish, Mississippi State University (MSU) and the University of Ibadan (UI)

Duration
July 2020–June 2023

Location
Ogun State and Delta State in Nigeria

Activities

1. Collect information on local catfish/tilapia epidemiology and health economics using online epidemiology tools.
2. Identify trends of economically significant and emerging pathogens/diseases of catfish and tilapia in Ogun and Delta states.
3. Establish a sustainable rapid diagnostic service for local catfish/tilapia producers.
4. Establish tissue and pathogen biobanks using locally derived bacterial and viral isolates from catfish and tilapia.
5. Generate genomic big data from endemic pathogens for future development of autogenous vaccines.
6. Develop tailormade BMPs for risk reduction interventions in aquatic animal health management.
7. Build the capacity of farmers, aquatic animal health researchers, and service providers on biosecurity, passive surveillance practices, and sample collection.
8. Establish a networking and resource sharing platform for local catfish and tilapia farmers and service providers.
9. Train and monitor extension workers and government personnel on farmer guidance and uptake of BMP guidelines.
10. Contribute toward a national aquatic animal health management strategy for Nigeria.

Procedures

1. Identify risk factors for disease emergence, outbreaks, and spread (including seasonality issues) with respect to environmental and climate change risks.
2. Identify endemic, emerging and exotic pathogens, and quantify economic impacts in a regional model.
3. Isolate key pathogens from farming systems and seed supply networks, and sequence whole genomes using next generation sequencing.
4. Develop health management interventions in the form of BMPs that reduce fish disease risks for fish farming systems and fish seed supply chains, and implement capacity building activities tailored to the needs of various stakeholders.
5. Use research findings and capacity development activities to support the development and operationalization of a simple and practical national aquatic animal health and biosecurity strategy for the national CA to implement.

Outcomes

1. **Contextualised online epidemiological tool**: Local partners and universities in Nigeria can use the tool for training and education purposes. Risk factors identified from survey findings will help to reduce disease-related losses by improving stakeholders' knowledge on catfish and tilapia health management and biosecurity.
2. **Development of sample collection methods and delivery network for fish disease diagnostics**: The aquatic animal health network of experts and diagnostic lab facilities will continue to support farmers in Nigeria's South West region. The CAs can upscale the list of pathogens, sample delivery networks, and diagnostic tools developed through this project's regional model for use by actors from the private and public sectors nationwide.
3. **Establishment of biobanks**: Pathogens identified from affected catfish and tilapia farms will be used to build pathogen repositories that national researchers can access to advance aquatic animal health research on diagnostics, molecular epidemiology, and autogenous vaccines.
4. **Production of BMPs and training tools for capacity building**: Extension workers, farmer clusters, and universities can adopt training packages for better capacity building of farmers. Producers trained on biosecurity and farm BMPs will be better prepared to prevent disease incidence and deal with disease outbreaks.
5. **Adoption of national strategies in aquatic animal health management:** Recommendations from this project will be considered in drafting national strategies in Aquatic Animal Health management, backing policies and investments to further manage health risks in Nigerian aquaculture. Adoption of science-based health management practices by the catfish and tilapia industries will lead to reduction of fish losses due to diseases, prudent use of antimicrobials, more productivity, and increased financial and social benefits for small-scale farmers and their families. Overall, this will improve fish consumption, nutrition, and health among local consumers of aquatic foods, especially women and children.

Acknowledgments

About the Fish Innovation Lab

The Fish Innovation Lab supports the United States Agency for International Development's agricultural research and capacity building work under Feed the Future, the U.S. Government's global hunger and food security initiative. Mississippi State University is the program's management entity. The University of Rhode Island, Texas State University, Washington University in St. Louis, and RTI International serve as management partners.

For more information, please visit www.worldfishcenter.org

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