Adapting Best Management Practices for Enhancing the Profitability of Small-Scale Aquaculture in Ghana, Tanzania, and Kenya

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Project: Enhancing the Profitability of Small Aquaculture Farm Operations in Ghana, Kenya, and Tanzania

The growing aquaculture industry in sub-Saharan Africa has the potential to contribute to development and food security by providing jobs and a nutritious source of animal protein. However, further developing the aquaculture industry must be done responsibly. The adoption of best management practices (BMPs) can help mitigate the need for prohibitive environmental regulations on smallholder fish farms while also maximizing profits.

With USAID support, AquaFish used three outreach and diffusion techniques to promote adoption of two target technologies to increase effectiveness in small-scale aquaculture operations in Ghana, Tanzania, and Kenya from 2010-2014. The adoption of these technologies helps manage pond inputs and effluents, and results in increased economic, environmental, and agronomic efficiencies in fish production.

Effluent Management: Water Reuse

Improved effluent management practices include guidelines on pond operation, management of settling ponds and vegetation, drainage into wetlands, top-releases for partial drainage, and water reuse. Water reuse -- holding or recirculation -- provides environmental benefits, including:

- Mitigated water scarcity issues
- Enhanced production efficiency via nutrient retention
- Increased profitability

Water reuse in aquaculture also results in improved water quality in surrounding areas, as less nutrient-rich effluent is released into adjacent water bodies.

Target Technology

Using floating feeds instead of sinking feeds reduces the likelihood of over feeding, which saves on input costs and increases farm profitability. Researchers in Ghana and Kenya conducted profitability analyses, and found that if the floating feed technology is adopted, the average increase in household income would be:

- Ghana = $767.00/year
- Kenya = $728.49/year

Benefits also include:

- Reduced need for aeration
- Improved survival rates
- Reduced use of chemicals
- Better feed conversion ratio (FCR = weight of feed fed/fish weight gain)
- Better water quality

Nutrient Management: Floating Feeds

Central Media

Regional and national workshops targeting as many farmers as possible to expand first exposure to BMPs.

14 workshops were held in three countries with a total of 842 participants. These workshops taught all aspects of pond management, including pond construction and maintenance, business management, fish marketing and product development, economic benefits of BMPs, feeding strategies, and record keeping.

- Five workshops in Ghana (545 trainees)
- Five workshops in Kenya (172 trainees)
- Four workshops in Tanzania (125 trainees)

BMP Demonstrations

On-farm demonstrations of BMPs.

Data from demonstration ponds was compared to data from ponds with regular management techniques to provide with-versus-without comparison of the benefits and costs of BMP implementation.

- Eight demonstration farms in Ghana
- Seven demonstration farms in Kenya

Outreach materials such as posters, leaflets, and radio broadcasts in local languages, were used to educate the public and to promote BMPs

Lateral Diffusion

Development of networks through participation at workshops and on-farm demonstrations.

Farmers exposed and trained at workshops and demonstration sites constitute nodes in a social network. These farmers then spread information to other farmers, who also become nodes, propagating their own networks and laterally transmitting knowledge.

This method increases the exposure to BMPs and decreases the reliance on extension agents that may be under temporal or geographical limitations.