

RICE-FISH FARMING INCREASES YIELD, IMPROVES HOUSEHOLD NUTRITION AND INCOME FOR NIGERIAN FAMILIES

By the Farm Diversification team

Nnanna Hyacinth Chuckwu, a rice farmer in Ebonyi State, Nigeria, tended to his family's financial needs from his gains after the rice harvest, but in recent years, he reported low revenue due to seasonal drought and dry spells, affecting yield and leading to a shortage of food. However, since he participated in the first phase of the Feed the Future Innovation Lab for Fish activity on integrating agriculture and aquaculture systems to maximize production, Chuckwu now farms rice and fish together.

With the support of extension workers, the Fish Innovation Lab research team works closely with farmers in rural communities in Nigeria and held a series of pilot trials to modify rice fields to include fish farming. By harvesting two food commodities within the same area of land, there is the added benefit of having another commodity to make profit from if rice experiences crop failure or if there is loss in fish.

"I was pleasantly surprised when I was told I can combine fish farming with my rice farming," Chuckwu said. "I joined the activity because of the benefits I envisioned it would bring to me. I have been getting income from rice alone in the past, but now, I see the possibility of getting income from both rice and fish."

"Surprisingly, my expected rice yield did not reduce after I modified my farm to grow fish. In fact, at the end of the last farming season when I started rice-fish farming, my profit was larger, and my family's nutrition has also improved from eating both rice and fish instead of rice alone."

The Fish Innovation Lab research team provided entry-level training for smallholder Nigerian rice farmers like Chuckwu who had little to no knowledge of aquaculture and how to implement rice-fish farming at the farm level. One discovery made by the implementers was the high rate of fish growth seen in the rice-fish co-culture. The fish grew to eating-size within 3-4 months of production, and this was largely due to the feed formulation used, where rice bran and fish offal were sourced locally to replace the high-cost commercial fish feed ingredients, especially fish meal. The farmers also had the choice to periodically harvest for home consumption when needed and continue to nurture others to bigger-size fish.

The research team analyzed different combinations of feed ingredients in the laboratory to arrive at the best formulation for optimum yield outcome while considering both fish and human health. The use of this feed in the pilot plots has not only reduced the cost of fish feed for farmers, but also increased fish yield within the given time frame for rice harvest. In other words, rice and fish could be harvested simultaneously, instead of harvesting rice and leaving fish to continue to grow to a farmer-desired table size, which is the desired size to



Nnanna Hyacinth Chuckwu inspects the rice-fish farm. (Photo by Bamidele Omitoyin/University of Ibadan)



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sell fish. While it is possible to leave the fish in the trenches to continue to grow, harvesting the two food commodities together could save the farmers the time and labor costs of continuing fish farming after harvesting the rice.

Chuckwu said the activity has increased his knowledge on how to modify rice farming to be more profitable. He learned how to dig trenches for fish farming, manage the water, feed the fish for optimum growth, and how to care for rice within the new system.

"The knowledge impacted not just me, but also the people in my community because we came together at the rice-fish pilot plot and learned together," he said. "Some people thought combining rice and fish culture together was not possible, but now, they see that it is. When the fish was harvested last season, they were happy and surprised to see that this is possible, and they are eager to participate next season."

Chuckwu emphasized that rice-fish farming is a doable way to make more money and provide more food to consume at home. He stated further that what he learned from the Fish Innovation Lab activity is providing more opportunities for him and his family.

"In my home, we don't eat rice alone anymore," Chuckwu said. "We combine it with fish, and the health of my family has improved because we now eat a more balanced diet."

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.

www.feedthefuture.gov
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