Food and Agriculture Organization of the United Nations

DIVERSIFYING FARMING THROUGH AN INTEGRATED AGRICULTURE-AQUACULTURE SYSTEM

Integrating fish into rice farming is a diversification strategy that can lead to maximized productivity, increased incomes and improvements in food security and nutrition for rice growing communities. This practice of combining aquaculture and agriculture is widespread in parts of Asia; however, in other areas of the world, farmers lack the technical skills and inputs to implement it.

This project concentrated its efforts in Nigeria, which could benefit significantly from farm diversification to combat its high prevalence of undernutrition and undernourishment. The project design included elements to address the issues inhibiting the integration of aquaculture and agriculture in the country, and to develop templates, technological packages and adaptation and mitigation measures for potential challenges to the establishment of the system.

At its core, the project sought to refine the aquaculture-agriculture farm diversification methodology to suit agroecosystems and socioeconomic conditions in sub-Saharan Africa, and possibly other regions beyond Asia, with the ultimate aim of scaling up the benefits of this practice globally.

WHAT DID THE PROJECT DO?

The project successfully integrated aquaculture into rice farming in targeted sites in Nigeria through the introduction of aquaculture-related technologies for the co-cultivation of rice and fish, fish seed production, fish feed production and value-addition through smoking. Six pilot sites in the Kebbi and Ebonyi states were established, including two institutional plots at the University of Ibadan (UI) and Usmanu Danfodiyo University in Sokoto to support research and demonstration.

Far exceeding its target of 200 beneficiaries, the project reached 727 farmers, graduate students and extension workers who were trained on a variety of farm diversification processes. This group comprised 489 men, 232 women and 54 youths.

Two cycles of production showed positive results and led to a wealth of lessons learned, which, coupled with advice for rice farmers on transforming their fields into productive and biodiverse agroecological landscapes, were key outcomes of the project. The lessons learned also demonstrated that the practice is a viable farm diversification strategy and provided insights into how interventions can be tailored to country-specific contexts, showing great potential to generate benefits for rice-growing communities around the world.

KEY FACTS

Latest Approved Budget
USD 215 445

Duration
June 2021–September 2023

Resource Partner
Mississippi State University (MSU)

Partners
University of Ibadan (UI), Nigeria; and University of Georgia (UGA), United States of America

Beneficiaries
Fish farmers, farmer groups and farmer organizations

IMPACT

The project contributed directly to the achievements of SDGs 2 and 14 through the promotion of efficient land and water resources management for food production, climate action, and the boost to food security and nutrition that occurred thanks to the introduction of integrated agriculture-aquaculture in the targeted communities. Research conducted in the pilot sites revealed a 5 percent increase in rice yield and up to a 48 percent increase in income compared to rice monocropping, concrete evidence of the system's ability to improve the lives of farmer participants. Beneficiaries also reported increased dietary diversity owing to the ease with which they could integrate fish into their daily meals.

A knowledge-transfer request was made by Mali to scale up the initiative there, demonstrating the potential for the project to have a global impact.

SUSTAINABLE DEVELOPMENT GOALS

ACTIVITIES

- Research was conducted for the development of a knowledge base on agroecological wetlands for integrating fish into rice farming.
- Farming systems were analysed for the characterization of prevailing rice-fish farming practices and to gather evidence on how best to introduce and manage innovative and productive farming systems.
- The cost-effectiveness and sustainability of the agroecologically sound aquaculture operations were evaluated after being piloted.
- Technology packages for the sustainable integration of rice-fish farming were developed.
- Two innovation platforms on integrated agriculture-aquaculture were established.
- Situational analyses of markets, nutrition status, and the involvement of women and youth before, during and after the interventions were conducted.
- Surveys on the preferred and best performing fish species were carried out.
- The enhancement of business skills among farmers and their end-market opportunities were evaluated.
- Partnerships between scientists and the development community were strengthened to improve the linkage between food production and nutrition.
- Locally available fish feed ingredients were tested.
- A manual for small-scale farmers on business and investments was developed.
- A national conference on rice-fish farming was organized.
- Four policy briefs were developed to promote the inclusion of integrated agriculture aquaculture into food policy or national programmes.

Project Title
Aquaculture and rural communities: Farm Diversification strategy through integrated agriculture-aquaculture systems and nutrition-sensitive value chains for better nutrition outcomes

Project Code
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