



Food and Agriculture
Organization of the
United Nations



South-South and triangular cooperation

Scaling-Up integrated rice-fish systems

Tapping ancient Chinese know-how

Development challenge

Agricultural production and productivity in sub-Saharan Africa remain significantly lower than the global average.

There is an urgent need to address the production gap and enhance the adaptive capacity of Africa's agricultural landscapes, considering the rapidly growing population and changing climate. Interest in enhancing sustainable rice and aquaculture productivity across the continent is at an all-time high.

Development solution

The integrated rice-fish system is an ancient practice employed by numerous farmers in Asia. China, in particular, has mastered this farming technique where rice and fish grow simultaneously in a symbiotic relationship. Rice-fish co-cultures lessen the environmental impact of agricultural chemicals and help make rice farming more profitable:

- **fish feed and less pests:** fish eat weeds and pests, promoting weed-control and reducing insect damage. This improves the cultivation of rice, while also reducing fish feed requirements and the use of pesticides;
- **free fertilizer:** fish manure serves as fertilizer, and the movement of fish helps turn over and loosen the soil, promoting fertilizer decomposition and root development.

Results and lessons learned

- **Double the yield:** this practice has proven to double harvests. On average, the rice-fish culture methods yield a harvest of 6.7 to 7.5 tons of rice per hectare, and a total of 0.75 to 2.25 tons of fish per hectare. Hence, the output value of the integrated rice-fish culture is USD 8 550 to 17 100 per hectare – considered very high according to international standards.
- **Integrated technology:** rice-fish systems integrate fresh-water fishing farming and high-yield rice production technologies, which, even when practiced independently, have major spin-offs.
- **Diversified livelihoods:** the ecological soundness of rice-fish systems, twinned with the beautification of the landscape, can also stimulate ecotourism, contributing to diversified local livelihoods.

Rice and fish flourish together in Nigerian paddies

Rice-fish culture was introduced in eight states in the Federal Republic of Nigeria, which helped almost double rice and tilapia production at some of the demonstration sites. Capitalizing on this success, the China-Nigeria South-South cooperation programme expanded rice-culture to 10 000 hectares, benefiting hundreds of smallholder farmers and their families.

Enhancing aquaculture techniques in Uganda

Thirty-one Chinese experts fielded to Uganda supported farmers, extension officers and government officials in adopting and adapting to a wide range of aquaculture techniques. Knowledge and techniques were shared, including: the nets application covering ponds to protect fish; fish feed preparation for fingerlings; the water quality control and the prevention of fish diseases. The uptake of these practical technologies achieved significant results, particularly in the Busia and Budaka Districts:

- increased fish fertilization rate from 26 percent to 81 percent;
- improved cat fish fingerlings' survival rates, from 80 percent to 98 percent;
- development and improvement of fish feed formulas for different fish growth stages, including use of cassava residues;
- increased uptake of fish-farming and improved farmers' incomes.

Solution exchange

Through the FAO/China Trust Fund, over 80 Chinese rice-fish experts have been fielded to countries in Africa, Asia and the South Pacific for a two-year period. Other tools for knowledge exchange including training courses and workshops have been organized in China for participants from partner countries. A wide range of partners and stakeholders benefited from these exchanges, including farmers and key decision-makers supporting them: government officials, agriculture extension officers, business companies and local farmers.

Potential for upscaling

The accomplishment of rice-fish system on food production and climate change is attracting more countries to request technical assistance.

This integrated solution holds huge potential for upscaling. It is relevant and applicable to most rice fields, and the following technologies and methods can be shared with interested partners:

- rice field infrastructure improvements;
- fish/fry rearing and fish/fry stocking;
- rice cultivation technologies and support to the selection of the most applicable rice variety/ies for local climate and soil conditions;
- high-yield hybrid rice with compact plant types and strong resistance to diseases and pests, reducing the need for pesticides and fertilizers;
- effective field management practices; and
- harvest, pond storage and marketing.



Contact us

Interested partners are invited to get in touch with FAO for more information:

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