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FACT SHEET

Genetically improved rohu (*Labeo rohita*) for Bangladesh



Introduction

In Bangladesh, fish accounts for 60% of consumed animal protein, the majority of which is sourced from domestic aquaculture. Rohu is the most important aquaculture species in Bangladesh and a significant source of food and income for poor farmers. It is an indigenous major carp species, of which approximately 319,000 t are produced annually, representing a wholesale market value of over USD 950,000,000.

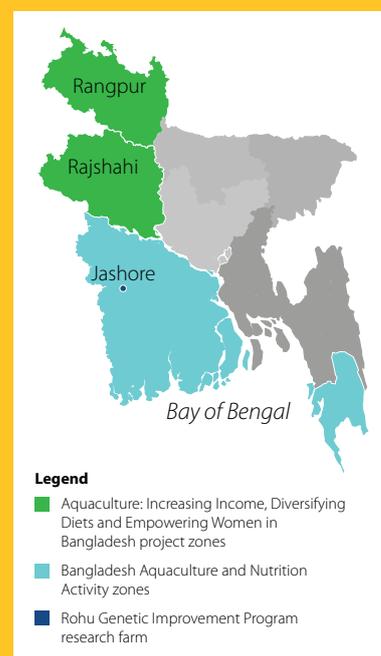
Project goals

The WorldFish Rohu Genetic Improvement Program aims to substantially increase aquaculture productivity in Bangladesh by developing and disseminating rapidly growing rohu to farmers. Genetically improved rohu seed will be available in Bangladesh beginning in 2020. These fish are expected to grow 20%–30% more rapidly than currently available seed. WorldFish expects to further improve the rohu growth rate by an average of 5%–10% every 2 years—the age at which new genetically superior parents can be selected and spawned. The organization is currently developing a dissemination strategy and business model to underpin a sustainable, genetically improved rohu program for the country.

Background

Rohu aquaculture in Bangladesh currently uses genetically unimproved stock. Furthermore, poor genetic management of broodstock (parents) in some Bangladeshi hatcheries has historically resulted in inbreeding, further reducing rohu productivity.

The WorldFish Carp Genetic Improvement Program uses a family-based selective breeding approach, which allows rapid genetic improvement while controlling inbreeding. Selective breeding has been adopted for thousands of years in agricultural species, but is relatively new to aquaculture. Programs in other fish species, such as genetically improved farmed tilapia (GIFT), have achieved ongoing improvements in growth rates comparable to those expected in rohu since their inception in the 1980s.



Donors

United States Agency for International Development and the Bill & Melinda Gates Foundation

Partners

Local and national governments, nongovernmental organizations and private sector partners, including local service providers

Project components

To optimize genetic improvement, research and development has been undertaken to accomplish the following:

- determine genetic relationships among founder fish sourced from rivers to allow greater control of inbreeding
- allow efficient rearing of individual families in fine-meshed nets (hapas) rather than earthen ponds
- investigate genotype-by-environment interaction to determine if genetically improved rohu perform consistently across multiple environments and under different management regimes
- investigate genetic improvement of traits other than growth rate (commencing in 2020).

In addition, WorldFish will conduct field trials to test genetically improved rohu against other Bangladeshi seed sources. These trials will be completed in 2021.

WorldFish recognizes that dissemination of genetically improved rohu will require the involvement of a number of partners. First among those will be the Ministry of Fisheries and Livestock and especially the Department of Fisheries and the Bangladesh Fisheries Research Institute. In addition, WorldFish will seek the support of a number of actors from civil society and the private sector. Every batch of fish being disseminated to partners will be screened for major diseases in Bangladesh by independent laboratories.

History of the WorldFish Rohu Genetic Improvement Program

2012	Spawn collected from three rivers in Bangladesh: Halda, Jamuna and Padma
2013	Fish from each river set aside as “unselected founders” of the breeding population
2014	Spawning of unselected founders
2016	First spawning of selected parents
2018	Second spawning of selected parents
2020	Third spawning of selected parents: progeny of the best parents are of Level 3 genetic quality

Dissemination activities

2020	Rohu spawn of Level 3 genetic quality to be released to hatcheries to become future broodstock; limited release of Level 3 rohu directly to farmers to assess performance
2021	Field testing of Level 3 rohu will be completed
2022	Level 3 rohu to be spawned in hatcheries and made available for large-scale grow out on farms; rohu spawn of Level 4 genetic quality will be released to hatcheries to become future broodstock

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