



Genetic Improvement Programs- Advisory Programs in Africa and Asia

WorldFish Genetics Workshop 17-21 October 2022
Basiita Rose and Trinh Trong (WorldFish)



WorldFish GIP Advisory Programs

1) These are programs that WorldFish is supporting technically at varying degrees based on the programs set up and funding commitments

1- Technical Assistance for Genetic Improvement of Kafue Bream (*Oreochromis andersonii*) at the National Aquaculture Research and development Centre (NARDC) in Zambia)

2- Technical Assistance to the Genetic Improvement program of the *Oreochromis shiranus* at the National Aquaculture Research Centre (NAC) in Malawi

3- Catfish breeding program (Nigeria)- WP4

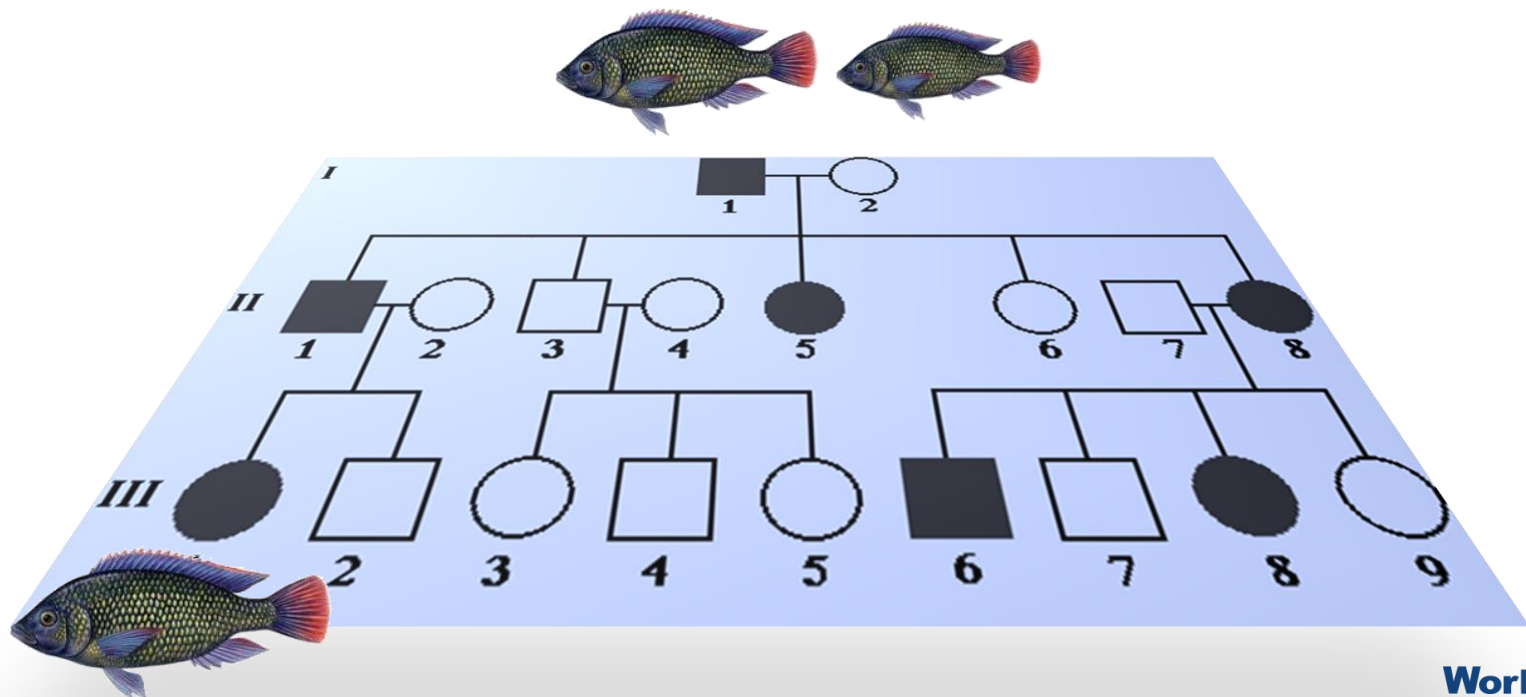
4- Technical Assistance to the GIFT selective breeding program at Rajiv Gandhi Centre for Aquaculture (RGCA)

Client: Ministry of Fisheries and Livestock

ii) Genetic improvement programme for *Oreochromis andersonii*

Pedigree based programme

- Growth/Harvest weight- major trait of interest
Improvement of seed quality for hatcheries and farms



ii) Development of a national genetic improvement program for the three spotted tilapia (*Oreochromis andersonii*)

1) Training and capacity building

2) Develop a base population upon which the breeding program is be built

3) Develop a dissemination strategy for improved seed

Training and capacity building



-Exposure visits of government staff to WorldFish core breeding programs

- Hands on- training in use of the fish measuring device to capture high through-put data, essential for a GIP

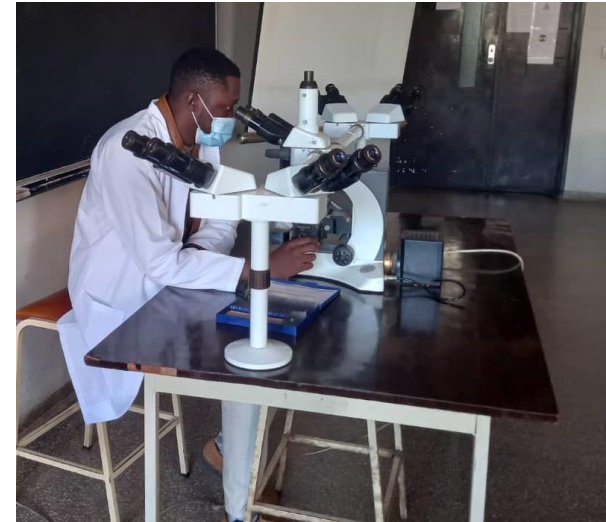


Capacity Building continued;

Long term training - WorldFish in supervision of research directly linked to the project (ZAEDP- GIP)

- One masters student supervised
- completed (Male) thesis now available

- 2 students still under supervision in their final stages (male + female)



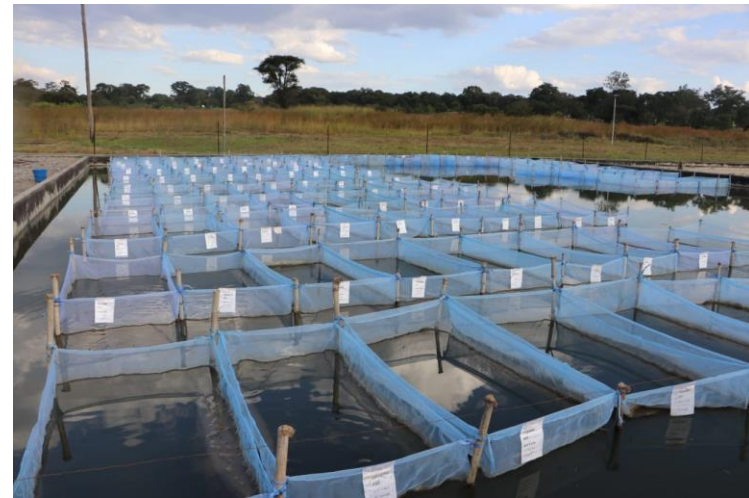
2) Develop a base population upon which the breeding program is built

- Broodfish received (5 sources) – Q4 2019
- Biosecurity: Disease screening to ensure a stock free of major tilapia disease (TiLV and EuS)
- Three clean group sources with limited numbers were retained for the program



Production of G0 and G1 - Progress cont.

- A limited number of families (G0) produced initially in 2021 was harvested (Q2)
- More 100 families were produced, tagged and stocked (Q2) 2022
- Candidates selected-Production of G1 commenced (Q3-Q4 2022)





Current Minister of Fisheries and Live stock: Visit at the breeding site at the NARDC, Copperbelt 12 Jan 2022

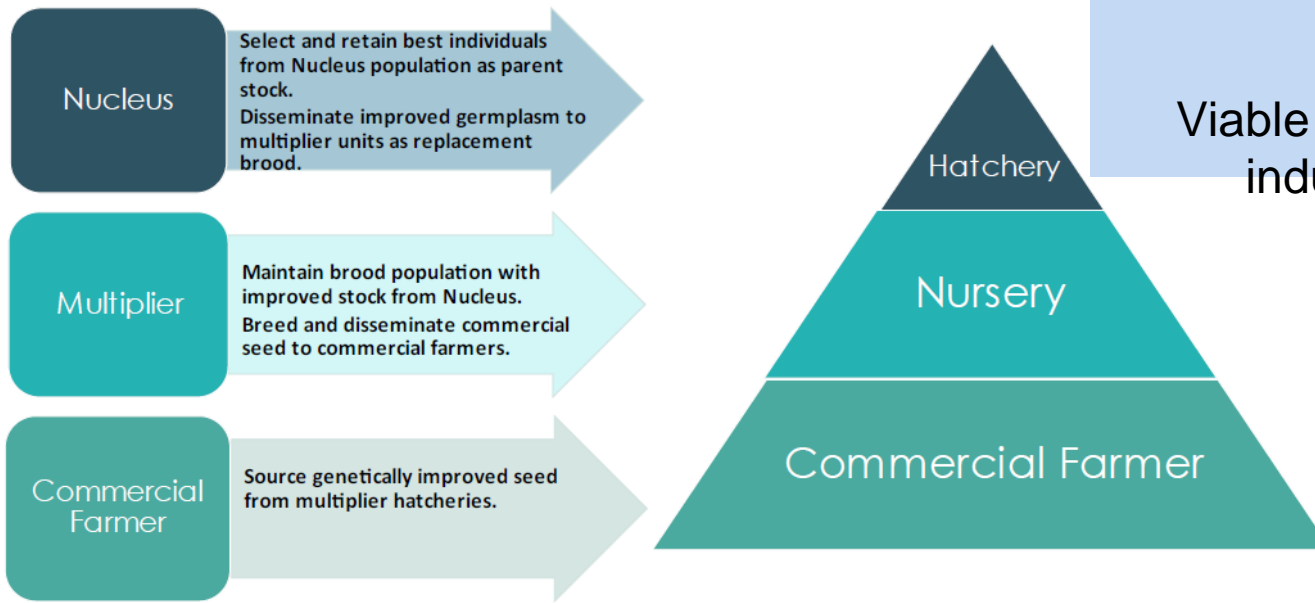
Dissemination strategy for improved Kafue Bream: From genetic gain to impact in fish

Private sector engagement is key for a self sustaining breeding program

Commercial sustainability will require a consideration of public-private sector partnerships

The nature of investment in maintaining the core improved fry production

Viable models to strengthen industry development

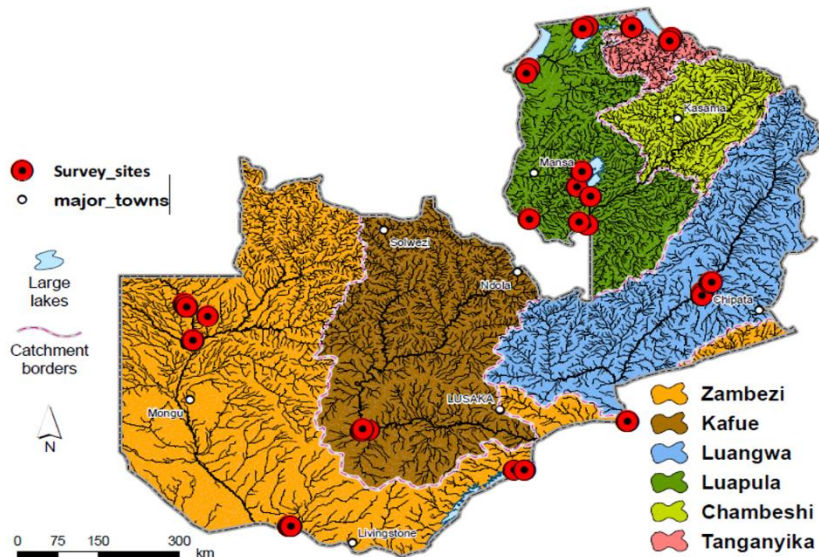


iii) Management of the existing Nile tilapia (*Oreochromis niloticus*) – Policy/Regulation

- Species comparison experiments - benchmarking performance - synergies FIL, DoF and NRDC.

<https://www.sciencedirect.com/science/article/pii/S2352513422003349>

- Species survey & Stake holder engagements - Policy



Some of the Key Experts (Technical, Finance and Admin)

Research Support , ADMIN and Finance

Dr Victor Siamudaala (Country Director Zambia and Southern Africa)

Mrs. Sakala Chindika (Accounts Manager, Zambia)+ Emily (PMU,HQ)

WorldFish - National Staff

Ms. Patience Chungu- RBPM (National scientist)

Mr. Buumba Hampuwo (Technical officer)

Mr. Tom Malambo (Research assistant)

Technical Experts

Prof John Benzie – Principal Scientist and Acting Director of Aquatic Foods Biosciences

Dr Trong Trinh – (Scientist -HQ)

Dr Rose Basiita – (Project Lead, Scientist- Zambia)



Thank You



GIFT selective breeding program at Rajiv Gandhi Centre for Aquaculture (RGCA)

Phase I (2011 to 2016)

Established a full-pedigreed selective breeding programme for GIFT in India

Transfer of 100 families (in two batches) from Malaysia:

2011: Base population (G0), 60 families

2016: 40 additional families for G5

Trait of interest: harvest weight

Mating design and mating list were provided by WorldFish scientist until 2016 (G7)

GIFT selective breeding program at Rajiv Gandhi Centre for Aquaculture (RGCA)

Phase II (2019 to date)

Continue to improve the performance of the GIFT strain in India

Trait of interest: harvest weight

WorldFish scientist has provided mating design and mating list to produce G8, 9 and 10



Lessons /Challenges

- WorldFish not in full control of the programs- facilities, equipment and human resource - Danger of loss of programs invested in if partners do not commit.
- Contractual agreements need to be well thought through before we commit
- Scientific evidence provided – will go a long way to influence policy
- Capacity building and collaborative partnerships are key in delivering outputs/outcomes
- Husbandry practices (feeds, feeding, nursing, tagging)- handling large number of families independently.

Thank you

