



Research Into Use

*sharing lessons to enable innovation in agriculture*

## **Fish farming innovation platform**

The Fish Farming Innovation Platform identified their priority as increasing fingerlings production of improved fish strain of *Oreochromis shiranus* (a Malawi NARS research output). At least 400 fish farmers are expected to benefit directly from this work.

RIU Malawi is working with two private firms (Milala Fish Farm & African Novel Resources) to produce the fingerlings. The platform also noted the quality of fingerlings for fish production was compromised due to absence of quality guidelines. Platform learning events are being delivered on an ongoing basis.

### **Progress**

By December 2009 identified the platform had 3 hatchery operators. These fingerling producers have been supported with technical advice, seed money for rehabilitation of ponds to expected standards and provided with happas for producing fries.

The platform is on track to have produced 2000 million fingerlings by February 2010. New guidelines for hatcheries for fingerling production have been produced by leading experts in the field. Malawi RIU has linked the Fish Farming Innovation Platform with INFOSA (a NEPAD fisheries network on fish trade in the South African Development Community region) to collaborate on improving the trade of farmed fish in Malawi. The Fish Farming Innovation Platform is a key agency delivering the strategy and plans of the Government Presidential Initiative for Aquaculture Development which was launched in 2006.

To ensure effective stakeholder participation in Fish Farming Innovation Platform the Innovative Fish Farmers Network (IFFN) was established and supported.

### **RNRSS outputs being reviewed by the Fish Farming Innovation Platform**

CPH12 - Partnership based innovation helps break bad habits

[AFGP01 – Household hatcheries are a major breakthrough in small-scale fish farming](#)

Fish Farming Platform Champion: Daniel Jamu, [World Fish Centre](#)

### **Background**

Fisheries resources play very important role in food and nutritional security of Malawi's population as it contributes about 60-70% of the annual animal protein supply of the nation. It is an important source of essential amino acids.

Fisheries sector provides source of employment to over 300,000 people through fishing and its associated activities. The sector contributes about 4% to the nation's Gross Domestic Product (GDP). In addition,

fisheries resources provide a source of livelihood to about 1 million people (about 10% of nation's population) in the lakeshore districts.

Fisheries resources in Malawi are mainly derived from capture fisheries from five water bodies comprising of Lake Malawi, Malombe, Chilwa, Chiuta and Shire River. The average nation's annual landings fluctuate widely between 30,000 tons and 80,000 tons however showing drastic decline trend, with major stocks of tilapia declining from 23,000 tons in 1984 to 7,000 tons in 2001.

The current nation's average annual catch of 57,000 tons for all fish is significantly lower than annual catches (80,000 tons) in 1970s. Decreasing catches juxtaposed with population growth has led to declining per capita fish supply. The annual per capita fish supply used to be 12.9kg in 1970s, has declined to 5.7kg which is by far the World Health Organization recommended figure of 15kg.

### The challenges

The Government of Malawi is promoting fish farming. Current production is low. 4,000 fish farmers scattered nationwide, owning over 8000 fish ponds produce about 1,500 tons of fish.

The platform identified the bottlenecks in order of importance as:

- Lack of quality inputs (fingerlings and feed for ponds and cage culture)
- Extension services and information system
- Inefficient marketing system (fingerling, feed and table fish)
- Lack of capital

The national target has been outlined in Presidential Initiative in Aquaculture Development (PIAD), to increase fish production from current production to 10,000 tons by 2011. It is considered very unlikely if the sector could meet the target without innovative approaches.

The platform decided to tackle the first core of problem of lack of quality inputs (fingerlings and feed for use in cages and ponds).

### Innovation Context

Use of quality fingerlings has several advantages:

- Farmers would be assured that the cultured fish come from fingerlings of know age and parentage. Impact -this would reduce stuntedness and improve on yield.
- Quality fingerlings would ensure that the fish produced are of significantly of same sizes. Impact - this would increase market competitiveness of cultured fish.

The currently commonly cultured fish, *Oreochromis shiranus* is characterized by early maturity at as early as 8g and reproduce prolifically, resulting in stunted growth and low yields.

On average, fish production from small-scale fish farmers range from 20 to 58kg per harvest per pond. These figures are small by any standards if fish farming is to make meaningful contribution to nation's economy. The use of fast growing exotic fish species in Malawi is restricted for fear of negative effect these exotics could bring to the aquatic fauna. The platform considers the use of improved indigenous fish species for fingerling production as the only option to increase fish production.

## Research outputs into use

The Government of Malawi, with support from CGIAR, World Fish Centre, implemented a National Tilapia Programme to develop an improved strain of *Oreochromis shiranus* at its NARS, National Aquaculture Centre (NAC) [<http://www.worldfishcenter.org/wfcms/HQ/Default.aspx>]

The strain has been developed through a rigorous selective breeding programme for 5 generations and the output has been tested on farm condition and has shown to grow 60% faster than their local counterparts.

## Blockages for use of research output

The benefit from the use of improved strain would be short lived if poor brood stock management and fingerling production and dissemination procedures are not followed. The use of improved fingerlings in Malawi has several blockages including:

- Lack of dissemination structure and regulatory mechanism. The platform noted that there is no guidelines and code of conduct for players in the dissemination process of improved fingerlings. The monitoring institutions lack proper monitoring tools
- Players lack capacity to implement the dissemination programme. The breeding centre has inadequate number of brooders, fingerling producer lack management skills for brood stock management and fingerling production techniques.

Farmers have very minimal skills of fish farming management and are segregated among themselves such that they lack powers to amass production and influence actions to demand fair practices and services in the fish production value chain.

## Impacting on these blockages requires technical and financial support

### Objectives

The project was thus developed to with the main objective to increase fish production through the use of improved fish strain of *Oreochromis shiranus*. The project would like to achieve specific objectives of

- Produce improved brood stock
- Produce fry and distribute to satellite stations
- Produce fingerlings and distribute to farmers
- Facilitate farmers mobilization
- Produce formulations using existing formulations

In February 2009 these objectives were refined to

### Main Objective

- To increase quality fingerling production of new strain for *Oreochromis shiranus*
- The specific objectives became:
- Quality fingerlings production guidelines developed
- Production of quality fingerlings promoted.

- Fingerlings distribution model developed and disseminated.

The expected outcomes from the initial plan were to produce:

- Produce 50,000 brood stock
- Produce over 5 million fry
- Produce 5 million fingerlings
- Formed 20 groups

### **The plan**

A dissemination structure is needed with the breeding centre at National Aquaculture Centre at its centre. Guideline were needed to facilitate distribution of the research output. Brooders need to be sold to hatchery operator. The centre will need to have adequate hapas to hold brooders and feed will be purchased to facilitate breeding process. Oxygen is required for transportation of fingerlings. In addition monitoring equipment such as water quality measuring toolkits would be purchased to facilitate proper monitoring of the performance of the fry nurseries.

Hatchery operators will produce hatchlings that will be distributed to the satellite station. Most of potential hatchery operators do not have appropriate facilities. Seed money was needed to purchase wheelbarrows and cement for pond and tank construction. The deal proposed was that the platform provided the materials and the hatchery provided the labour.

The hatchery operators also needed training in intensive brood stock management and fingerling production. Hatchery operators were required to pay for the brood stock.

The proposal was that satellite stations would rear the fry to fingerling sizes that will then be distributed to grow out farmers. These will be trained in fingerling production and provided with nets.

The platform planned to form associations of grow out farmers, forming clusters of production.

Feed is a crucial issue. The platform planned to use seed money to sensitize potential fish feed producers such as millers. Existing formulations were to be provided to those willing to produce fish feeds.

### **General recommendations**

- Need for phased implementation plan
- Need to be specific on who the beneficiaries are
- NAC should produce broodstock using own resources and sell on the hatchery/nursery operators
- Need to have clear modalities of financing the implementation plan (revolving fund)
- Hatchery/nursery operators should provide apprenticeship training to potential satellite growers

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