



**Improving
fisheries
in Cameroon**

The Republic of Cameroon is a tropical West African country, slightly larger than California (475,000 km²), lying 6° north of the equator and 12° east of Greenwich. Recent estimates place the population slightly above 16 million. The terrain is diverse, a coastal plain in the southwest, a central plateau, mountains to the west and plains in the north. The land supports a variety of vegetation types including tropical rain forests that are under threat from slash and

burn agriculture driven by increasing poverty and the demand for land from a rapidly growing rural population.

The WorldFish Center is working with partners on initiatives aimed at sustainable management of the humid forests. Integrated agriculture-aquaculture (IAA) has been identified as a suitable livelihoods strategy for Cameroonian smallholder farmers. Farmer-scientist research partnerships have been set up to assist with the extension and support work.



Integrated Agriculture-Aquaculture

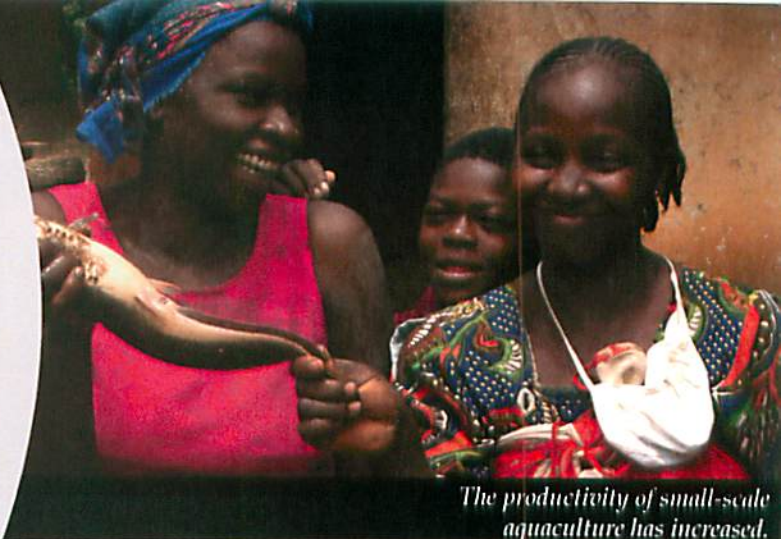
In the Central Province of Cameroon, fish is the most important source of animal protein in the diets of both rural and urban households and its importance increases among the poor. With a 50% decrease in availability of fish per capita over the last 10 years, demand and prices for fish are extremely high, creating new opportunities that could be exploited by market-driven, small-scale fish farmers.

Early forays into aquaculture in Cameroon were not successful. Introduced in the late 1940's, more than 10,000 ponds had been built by 1962 but many of these were subsequently abandoned, largely as a result of top-down extension disseminating inappropriate technologies to farmers with no access to markets or external inputs.

This experience led the Government of Cameroon to seek partnership with the WorldFish Center in 2000 with the aim of establishing a farmer-participatory approach to aquaculture outreach and development. WorldFish, with its background in successful participatory research and development, joined the International Institute of Tropical Agriculture (IITA) and the two government agencies dealing with aquaculture, the Institut de Recherche Agricole pour le Développement (IRAD) and the Ministère de l'Élevage, des Pêches et des Industries Animales (MINEPIA) who contributed their considerable knowledge on local aquaculture practices, socio-cultural norms and years of practical local experience promoting fish farming.

With financial support from the UK Department for International Development (DFID), the project – **Development of IAA Systems for Small-scale Farmers in the Forest Margins of Cameroon** was implemented in order to create income and food generating alternatives to slash and burn agriculture; to improve rural and peri-urban livelihoods through aquaculture; and influence policy changes that would favour the growth of sustainable, integrated aquaculture farming systems.

WorldFish Center aquaculture experts, IITA economists, IRAD researchers and MINEPIA technicians formed a Research-Extension Team (RET) to undertake action research on the importance of markets in driving aquaculture intensification. The primary objective was to understand the processes that create increased opportunities

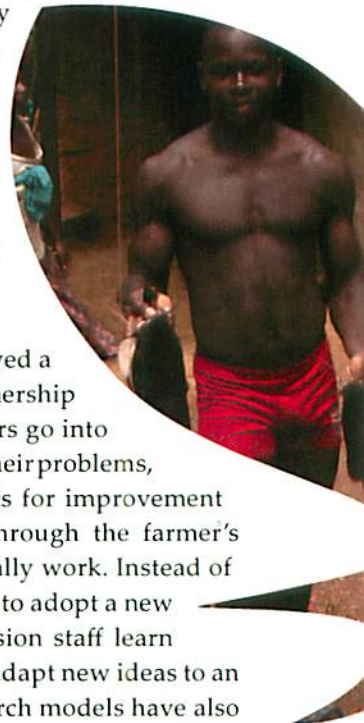


The productivity of small-scale aquaculture has increased.

for small-scale farmers to improve their livelihoods while decreasing pressure on natural resources in the forest margins.

At ground level, the RET worked directly with farmers and non-governmental organizations (NGOs) to disseminate information and improve human resource capacity in terms of aquaculture technology and delivery mechanisms. A number of training courses were undertaken to reinforce basic aquaculture technology as well as develop new research and analytical tools for use by the national agricultural research system (NARS).

The RET developed and employed a Farmer-Scientist Research Partnership (FSRP). Participatory researchers go into the field, meet farmers, discuss their problems, identify possible starting points for improvement and then screen their ideas through the farmer's knowledge of what might actually work. Instead of attempting to convince farmers to adopt a new technology, farmers and extension staff learn together how to incrementally adapt new ideas to an actual farming situation. Research models have also altered, with the emphasis on analysis of variance as a statistical model changing to multiple regression, and with this, from letting farmers choose from a range of established technologies to one of adapting a single generalized technology in innovative ways to a number of farming situations. This change came about primarily as a result of farmers not wanting to be part of treatments that were expected to fail. With a regression model, careful monitoring of a range of biophysical and management parameters



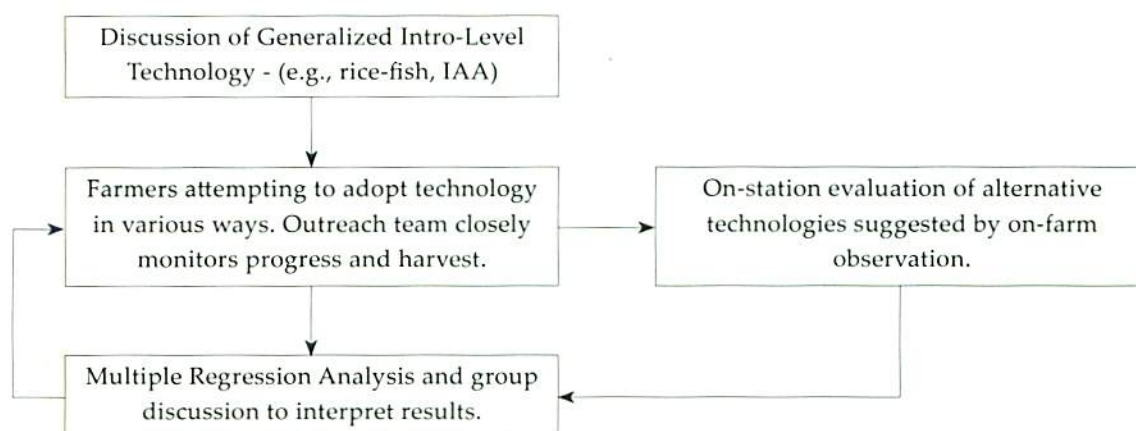


Creating new opportunities that could be exploited by market-driven, small-scale fish farmers.



Fish is the most important source of animal protein in the diets of both rural and urban households

Figure. The Farmer-Scientist Research Partnership (FSRP), a participatory research and development tool for encouraging the adoption and intensification of farming systems.



permits the researchers to retroactively identify the salient features of those farms where production was improved.

OUTCOMES

Changes in fish production & number of fish farmers from IAA

Productivity of small-scale aquaculture increased from 498 kg/ha to 2525 kg/ha. The number of active fish farmers in the target areas increased from 40 to 137, among whom cash returns from aquaculture increased 16-fold. Farmers not directly participating in project activities also benefited such that 262 small-scale farmers with 870 ponds are currently producing 14.4 tons per annum (\$54,000 wholesale) for the Yaoundé market. In addition, fish consumption by the farm family rose to an average of 66 kg/family/yr and 10 kg/family/yr in peri-urban and rural areas, respectively. These increases are due

to the application of improved management systems engendered by access to appropriate technological advice provided by the RETs.

Changes on farm: peri-urban v rural

Farming system diversification through the integration of aquaculture significantly increased the productivity, intensity of production and profitability of small-scale farms in peri-urban areas. Among farmers with good market access, net profits rose by a factor of 4. The amount of fish retained for consumption by the farming family was higher in peri-urban areas (26% vs 17% in rural areas) as freezers were available to store fish for later use.

Research has shown that the provision of high-quality technical advice to farmers with market access can have





a strong positive impact on farm productivity and profitability among small and medium-scale farmers. In areas with little or no access to markets, the number of fishponds and fish farmers can be increased and pond productivity can be improved, increasing local food supplies.

The potential of African rivers to supply the ornamental fish trade

A number of species have been identified that have a substantial potential for trade as ornamental fishes. Among those identified in south-west Cameroon, the genera of greatest interest to the ornamental fish trade include: *Aphyosemion*, *Benitochromis*, *Brienomyrus*, *Brycinus*, *Caecomastecembelus*, *Chiloglanis*, *Doumea*, *Parauchenoglanis*, *Pelvicachromis* and *Procatopus*. In Europe, the retail value of these fishes ranges from \$2.00 to \$20.00 each. African rivers contain over 200

species of ornamental fish valued at \$1.8 million per tonne by the international aquarium trade. A new project "Sustainable use of African Rainforest Rivers" was awarded a \$150,000 grant in 2005 at the World Bank Development Marketplace competition. The project expects to develop community based business models to raise and sell ornamental fish through a multi-stage capacity building program, developing commercial aquaculture skills for at least 150 fishers and increasing returns to local communities by at least 500 per cent.

The Strategic Framework for aquaculture in Cameroon

The project also worked with local and international agencies to define, describe and institutionalise a Strategic Framework for Aquaculture Development. The model was first applied in Cameroon, but through collaboration with FAO is now being adapted to a number of other countries within the region.

This planning document developed jointly by FAO, WorldFish, MINEPIA and IRAD puts in place a structure and set of guidelines for improving government's involvement in encouraging aquaculture development. This document spells out the roles of government, NGOs and the private sector in the provision of basic support services and policy, and will serve as the template for further policy development in Cameroon. ☺

Support and investment through:

DFID (UK)
FAO Food & Agriculture Organization of
the United Nations
Humid Forest Ecoregional Center
Government of the Republic of Cameroon

WorldFish Center partners:

Ministère de l'Élevage, des Pêches et des Industries
Animales (MINEPIA)
Institut de Recherche Agricole pour le Développement
(IRAD)
Service d'Études et d'Appui aux Populations à la Base
(SEAPB) (NGO)

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US\$ 1 = 525 Communauté Financière Africaine
Francs (Feb. 2005)
Photos: R. Brummett, C. Bene' and WorldFish Center