

A Fish Farmers Cooperative in the Central African Republic

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Since March 1987, there has been an experimental fish farmers cooperative near Bangui, in the Central African Republic. Its objective is to increase the productivity of existing ponds: currently 2-3 mt/ha/year. Previous attempts to expand aquaculture (mainly pond culture of tilapia) in the country have had limited success, principally because the use of small ponds meant that individual farmers could not buy fertilizers and fish food in big quantities and therefore at lower prices. Moreover, the costs of guarding each pond were too high. A program of small loans to the best farmers was established to help them to increase their number of ponds and quantities of inputs. Unfortunately, although farmers readily accepted such loans, they failed to implement better technologies and their production/ha failed to increase significantly, retarding loan repayment. Therefore, it was felt that organising a cooperative might provide a better basis for the implementation of improved technology, particularly intensive organic fertilization.

A group of about 30 fish farmers went to the OCSA (Organisation Canadienne pour la Solidarité et le Développement) to ask for technical assistance and a volunteer was sent to help them to get organized and identify their needs and objectives. The core of the group belonged to the same religious community, in which they already played an important role, and were therefore respected and trusted. Two of them had previous experience as instructors in village cooperatives that functioned more or less like a kibbutz. They had been trained in the 1960's by Israeli cooperation officers.

After six months of activities in helping each other, a majority of the group members felt that their cooperation would be much simpler and more efficient, if they were to consider their enterprise as a common property. Each individual had already used the other members labor for their own needs, but there had been no significant changes in farming methods: farmers were reluctant to try new techniques solely on their own ponds. They

had learned to produce some fish and to gain a little income, and did not want to risk the loss of these minimal benefits.

The group was then encouraged to use an abandoned fish farm a few kilometers from their own area, while continuing the exploitation of their own ponds individually. This abandoned farm (0.6 ha of ponds) had been disused since the agrarian reform, more than fifteen years ago. The government gave the group permission to farm it as a private enterprise for an initial period of five years. The members worked for two first months on essential renovations, with materials purchased through Canadian Embassy support funds for local initiatives. The system adopted had to be as simple as possible in order for each member to understand it perfectly and to be confident he would not be "used" by the leaders. All the fish farmers were men. Their wives did market gardening on the farm site and were later encouraged to join in fish culture and other activities as the men also diversified their activities.

A system of shares was introduced, where four hours of physical work, one night of guarding, or one morning of selling goods at the market, was worth one share. Everytime a member fulfilled one of these tasks, he received one stamp in a booklet, signifying the acquisition of one share. A three member Executive Committee received twenty shares each at the beginning of the enterprise, to compensate for their time spent in administration and management.

After each cycle (between four and six months), the total income was calculated; money necessary to repeat the operation (plus a 10% cushion) subtracted, and the rest divided by the number of shares distributed. Obviously, this is not a very flexible or sophisticated administrative system, but it was designed simply to ensure full understanding and confidence of the members. As the cooperative gets older, it can develop more flexible accounting methods.

Every week, the work to be done and labor required were planned by the Executive Committee. This was done keeping in mind the predicted production and income, in order to keep the value of shares as high as possible. If an individual showed up without having been asked to, he was not permitted to work. The basic disciplinary rules were proposed by the Executive Committee in a general assembly, so that the committee was applying what had been accepted by everybody

and was, as far as possible, protected against accusations of arbitrary judgement.

The simplest and cheapest methods were used to produce fish and to generate profit as soon as possible. A mixture of dried chicken manure (1.30 kg) and fresh beer waste (0.27 kg in dry weight) was added to ponds daily/100 m². This corresponds to about 10 barrowfuls of the mixture in equal volumes/ha/day. The manure was brought from an industrial chicken farm 18 km away. The cost of one kilo of manure after transportation to the farm was 8 F CFA (1 US\$ = 333 F CFA). The beer wastes were given and transported free to the farm by the brewing company.

The total net production after six months for 0.55 ha was 2,570 kg of *Oreochromis niloticus* and *Cyprinus carpio* (stocked at 2/m² and 0.2/m²; unsexed fingerlings of 10 g and 5 g, respectively). This gives an extrapolated yield of 9,345 kg/ha/year. Only 22% of the total harvest was composed of *O. niloticus* with individual weights of more than 100 g (all these were males), sold at 800 F CFA/kg in Bangui. Most of the rest was sold at 300 F CFA/kg, and some live 10 g fingerlings were delivered to farmers outside the cooperative for 600 F CFA/kg (Figs. 1 and 2). The carps made 7.5% in weight of the total harvest, with a mean individual weight of 170 g, and were worth 800 F CFA/kg in the Bangui market. The total income was 1,158,000 F CFA, and the net profit for distribution was 773,000 F CFA, giving a share value of 554 F CFA. This share value increased to 769 F CFA when combined with profits generated by raising 200 ducks on the farm: needing no increase in the number of shares since the little work needed for the ducks was done by individuals guarding the farm. Of 1,395 shares distributed, 879 (66%) shares were for guarding.

The value of a share is expected to increase significantly now that the cooperative is diversifying its activities into market gardening and small-scale poultry rearing. Moreover, the members have started to apply to their own ponds the methods used at the cooperative farm, as well as using cooperative resources such as tools and fertilizer (loaned/sold to the members only) to increase their own production. Two members have achieved similar production in their own individual ponds generating 200,000 F CFA revenue from 0.1 ha of pond in 5 months.



Fig. 1. Members of the Farmers Cooperative proudly showing an aerator (handmade from a used car fan) for live fingerling transportation.

Fig. 1. Des membres de la coopérative montrent avec fierté un aérateur artisanal fabriqué à partir d'un vieux ventilateur de voiture et servant pour le transport des alevins.



Fig. 2. At the start of the fourth month of each six months cycle, small tilapias (10-50 g) are regularly seized from the ponds to be sold either in the market place or as live fingerlings for further growout.

Fig. 2. A partir du quatrième mois de chaque cycle de six mois, les petits tilapias (10-50 g) sont pêchés à la senne régulièrement pour la vente au marché ou distribués vivants aux éleveurs comme alevins.

At this stage, it is difficult to draw conclusions as to the future durability of the cooperative, but as long as the members profit financially the chances are that it will last. The cooperative's new aims are to find better marketing strategies for a projected increase in production, and to improve the quality of their produce, mainly through monosex tilapia culture. However, the basic intensive production of small tilapias will continue, as it provides a cheap fish product that is available to a majority of customers who otherwise simply cannot afford to buy

fish. The 250 g tilapias produced with monosex techniques are meant to compete with frozen marine fish, imported increasingly in Bangui. Although the cooperative is actually self-administered, a volunteer should continue to provide technical advices for a predicted total period of four years.

Workshop on Aquaculture Research in Africa Bouaké, Côte d'Ivoire, 14-17 November 1988

This workshop brought together 30 participants and 30 observers from 13 African countries and from research support agencies (e.g. CTFT/CIRAD, FAO, ICLARM, IDRC, ORSTOM). Participation was wide-ranging geographically: Egypt, Zambia and Sénégal represent the extremes of the range. Most participants were active aquaculture researchers or development workers. The objectives of the workshop were to present ongoing work, to increase contacts between workers, and to discuss mechanisms for better coordination of aquaculture research activities. Simultaneous interpretation greatly assisted communication between francophone and anglophone workers. The workshop was jointly organized and funded by IDESSA, the Ministry of Water and Forests of Côte d'Ivoire, ADCP of UNDP/FAO, and IDRC.

Twenty six technical presentations were made; a report of the workshop incorporating these will be published by IDRC. Presentations were wide-ranging. Several covered basic work on particular species or systems: e.g. genetics of tilapias, trials with a catfish new to culture in Africa (*Heterobranchus longifilis*), salinity tolerance of tilapia species and hybrids, and responses of pond plankton and productivity to fertilizer regimes. Others covered practical field experiments: use of appropriate feed-stuffs, species combinations in pond culture, and harvesting regimes in cage culture of tilapia. Still others covered large-scale system trials (non-drainable brackishwater ponds; intensive and extensive enclosures systems for lagoons; tilapia-based systems in ponds), and results of village-level extension attempts. Two papers covered social and economic aspects of aquaculture: a survey of how fish culturists have learned

and applied techniques, and an economic assessment of the performance of several tilapia-based systems. Finally, several papers were presented on general aspects of fish culture research in Africa.

Synthesis is difficult, but it can be said that aquaculture research is well under way in Africa and that researchers need more such opportunities to exchange results and ideas. Better focussing of research efforts on high-priority problems of producers might result from increased interaction, a process initiated at a previous workshop on African Aquaculture Research Priorities, held in Dakar in 1986.

Half the workshop was devoted to discussions on networking. Four agencies presented aquaculture research networks which are either operational (ICLARM) or planned (CORAF; FAO/UNDP; IDRC), of varying scope and objectives. Discussion centered on ways of ensuring that African researchers from the region could influence communication channels so that their real needs are met. It was concluded that networking should be encouraged, that researchers should make full use of networks, and that coordination merits further discussion. Six researchers from the region formed a group to work towards this. Several participants also presented their plans for applied research projects to be proposed to various donors. These were discussed and the feedback will help the proponents.

The workshop included a field trip to a number of interesting aquaculture sites in the Bouaké area, including the tilapia/*Clarias* fry production station at La Loka (part of the FAO/UNDP/Ivory Coast Rural Fish Culture Development Project). This is particularly interesting for its "low-tech" approach in the *Clarias* hatchery - all equipment is made from locally-available materials and costs are minimal. Low pond survival of fry is the major constraint. Two of the Project's farmer cooperators were visited; both are getting good results with tilapia-based systems; one is converting to fish culture from rice culture because profitability is better. Last stop was the IDESSA fish culture experimental station. Formerly administered by CTFT, this is one of the oldest and best-laid-out stations in Africa. A broad range of research is carried out, including improvements to tilapia-based systems (e.g., better feeds, combination with predators, monosex culture, tilapia hybridization, and culture of native