

Tilapia Culture in Sudan

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Background

In the early 1950s, fishfarming was suggested as a potential means of increasing fish availability in Sudan, particularly in areas far from fisheries. In the mid-1950s, an experimental fish farm was established and rainwater reservoirs in western Sudan and in Equatoria Province in the south were stocked with *Oreochromis niloticus* (see Newsletter, October 1985, p. 14). Tilapia also began to be cultured in numerous privately owned agricultural farms in Khartoum and El-Gezira Provinces to complement crop and livestock production.

Current Status

Fishfarming has grown at a very slow pace and *O. niloticus* has remained the only species raised in ponds. The total area occupied by fishponds until 1983 was estimated at 38 ha; about 45% is in the irrigated sugar estates where tilapia is produced for laborers. In 1984 only 25 ha remained in operation.

The growing ponds are always earthen, constructed on good agricultural land and relatively small (0.04-0.42 ha). Fingerlings are provided by extension agents.

The fish are spawned naturally in small earthen ponds. Selection of breeders is done every year to increase seed production; however, measures to avoid inbreeding are not properly undertaken. Peak spawning occurs in April and each female, averaging 300 g, produces about 900 fry per year. The hatchlings are grown in the same spawning ponds and when they reach 5 cm, the pond is partially drained and fingerlings are collected, hand-sexed to obtain all-male tilapia and then kept in *hapas* or concrete tanks until needed.

The average stocking rate of tilapia males is low—only 3,500/ha. Facilities for producing fingerlings for sexing are limited. For the same reason, mixed culture of tilapia is also practiced. Excessive breeding is controlled by periodic thinning of the population.

Fertilization consists of an initial dose of 1,000 kg of chicken manure, then a biweekly application of 119 kg/ha throughout the six-month growing period. Fish are also fed with a supplementary mixture of oil cakes and wheat bran in a 1:9 ratio. The feed is provided in the form of a meal at a rate of 3% of body weight per day, six days a week.

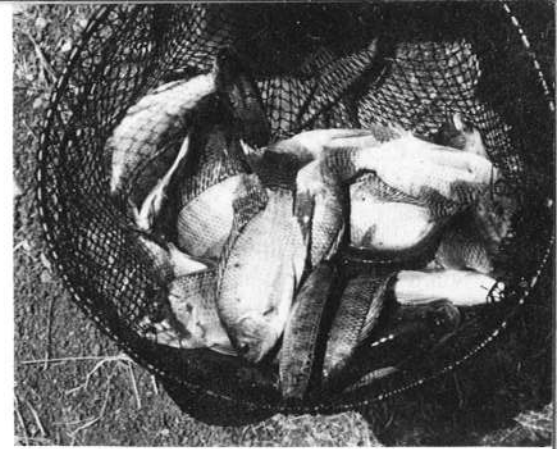
After six months, the fish average 250 g and total yield is about 700 kg/ha. Fish are harvested by complete draining of the pond, and are sold on the bank to a wholesaler or transported to market. Tilapia is classified as a second class fish and sold at £s1.75/kg (one Sudanese pound = \$0.29).

Analysis of the economic merits of a 1-ha male tilapia pond for the first year (start-up period) indicates that the rates of return on investment and on operating cost are 1.1 and 12.2%, respectively. Total nondepreciable and depreciable investments are £s8,330 and £s1,092, respectively. The most important cost items are usually equipment and feed, which account for 41.2 and 20.6%, respectively.

The production system is theoretically designed to be continuous over a two-crop system per year, but due to the unavailability of tilapia seed it is confined to only one crop per year.



Extension agents examining a fishpond at El-Guneid Sugar Factory—Central Sudan.



Oreochromis niloticus averaging 250 grams have been harvested from Halfa El-Gedida fish farm—Eastern Sudan. Photo by Galal A.E. Abass.

Prospects

At present, fresh fish from capture fisheries yielding 29,000 t/year is available only around production sites. Lack of adequate storage and ice-making facilities, as well as poor transportation linkages in the country, make this commodity beyond the reach of the needy, particularly in the rural communities where there is food shortage. In such areas, the development of fishfarming is essential and has great potential. However, being in its infancy, fishfarming requires enormous effort before it can boost food supply.

Tilapia farming in Sudan has not been successful due to the following factors:

- 1) lack of funding (including international and bilateral assistance) for research programs. The government does not fully endorse fishfarming compared with other agricultural and animal husbandry practices in the country.
- 2) unprofitability and unpopularity of the present method of tilapia culture. The solution would be mixed culture with other native species which are highly preferred and which command high prices.
- 3) weak extension policies for on-the-job training for fish growers.
- 4) high cost, lack of organization and management in the use of reservoirs for fish production. The government should establish and manage a series of pilot fish farms to demonstrate their technological and economic feasibility.
- 5) lack of sound linkages between research and extension.