

## TILAPIA PRODUCTION AND ITS GLOBAL IMPACTS IN CENTRAL AFRICAN COUNTRIES

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### **Abstract**

Introduced in Africa, mainly Eastern region, aquaculture has evil to be established in many regions because of the existence of river, lake and lagoon traditional fishing which is very present. However, since, there is growing evidence that the fishery is being exploited beyond its sustainable limit, governments have started promoting aquaculture and culture-based fisheries.

The aquaculture production in Central Africa countries is made up almost exclusively of tilapia, in particular the species *Oreochromis niloticus*. Thus, commonly, tilapia is used in monoculture (with or without predator) or in mixed-farming with catfish or *Heterotis*, fed with rice bran or with compound feeding stuff, in addition to one more or less followed organic fertilization.

In Democratic Republic of Congo (DRC), fish production by aquaculture, all confused species, shifted from approximately 600 tons/year to about 3000 tons in 5 years period. This is the strongest production of Central Africa. In Cameroon, the production is more diversified with 3 target species: the common carp, the African catfish and Nile tilapia. But the total production is around 330 tons in 2002. The tilapia contribution is 70% of this production. In the other countries, production by aquaculture remained low. Aquaculture contribution in Growth Domestic Product for this region was estimated at 8 200 000.00 \$US in 2002 with about 70% (7 400 000.00 \$US) for DRC.

### **Introduction**

Contrary to other continents, aquaculture is a relatively new activity in the majority of the African countries. The history of the aquaculture in sub-Saharan Africa goes back to the years 1920, with the introduction of trout breeding in altitude in Kenya and in Madagascar, and later in altitude in Tanzania, once called Tanganyika. However, in spite of more than 40 years of practice in Sub-Saharan Africa, aquaculture remained there until now a marginalized activity. Also, it should be necessary to recognize the modicity of the investments repercussions in this area as compared to results recorded elsewhere in the world.

With regard to particularly Central Africa, it should be announced that this part of the continent has been shaken by civil wars and political instabilities. This situation contributed to the stagnation of this activity.

In order to better develop the potential available and under the impulse of an organization such as FAO, the aquaculture gained renewed interest. However, up to date, the aquaculture in the south of the Sahara is still not well developed. With a production of less than 15 000 tons, it accounts for hardly 0.5% of the world production. The estimated value reached 25 million dollars in 1990. The most significant producers were Nigeria, Côte d'Ivoire, Zambia and Kenya with approximately 1000 tons each, followed by Democratic Republic of Congo, Ghana, Tanzania, Congo, Madagascar and Sudan, with 200 to 700 tons each per annum. The main causes of this slow development were the lack of motivation of the farmers, the lack of capital, the low quality of fry and the low technical knowledge.

#### ***Tilapias production in Cameroon***

The beginnings of aquaculture in Cameroon go up to 1948, when the first dam for fish culture in Yaoundé was built. The interest caused by this new technique was such as nearly 5000 ponds were arranged in the Centre and the East of the country. Very quickly, a plan of development of aquaculture was set up in 1954. Then 22 fry production stations were realised, a service in charge of popularization was created and almost 10,000 rural ponds realised the farmers. Unfortunately, the results obtained, as everywhere else in Africa, were not satisfactory. Thus since 1965, the number of functional ponds decreased significantly.

Taking into account this situation, the Government subscribed in 1968 to a regional project of development of aquaculture covering Congo, Gabon, the Central African Republic and Cameroon. This project focused on training and the techniques of mixed-farming. Several other projects financed by various organizations (OXFAM, USAID, UNDP, CRDI), tried to start again this activity in several areas of the country. According to the data of FAO (1995) approximately 1500 fish farmers having 2000 ponds (170 ha of surface) were active in Cameroon in 1991.

The tendency observed during these past years was the renewal of aquaculture with nearly 3000 fish farmers at the end of 1997, having approximately 5000 ponds, for a total surface of 200 ha (Pouomogne, 1998). The production, estimated at 250 tons, was composed of catfish (more than 50% *Clarias gariepinus* and *Heterobranchus longifilis*). The last estimates reveal a clear increase in the production of tilapia (Fig. 1) which shifts from approximately 100 tons in 2001 to more than 200 tons in 2002 (FAO, 2002).

The financial value is more correlated with the produced quantity as compared to other countries. The contribution of tilapia production by aquaculture in Growth Domestic Product was estimated at 302 000 \$US in 2002 (FAO, 2002). However, this production remains very low despite the enormous aquaculture potentialities available in this country: 4 million hectares of interior water levels, 2700 km<sup>2</sup> of mangroves, 15 400 km<sup>2</sup> of continental shelf (Kouam, 2002).

The methods of production remain semi-intensive, consisting more in a valorisation of the ecosystem than in a transformation of a product towards another with greater added value. The current practice is the mixed-farming of the tilapia *Oreochromis niloticus* and the

African catfishes *Clarias gariepinus* or *Heterobranchus longifilis* in ponds fertilized. Fertilization is done in ponds and consist of compost. There are also breeding associated with the pig, chicken, duck or rabbit. The food is made up almost exclusively of rice bran, drafts of breweries or culinary waste.

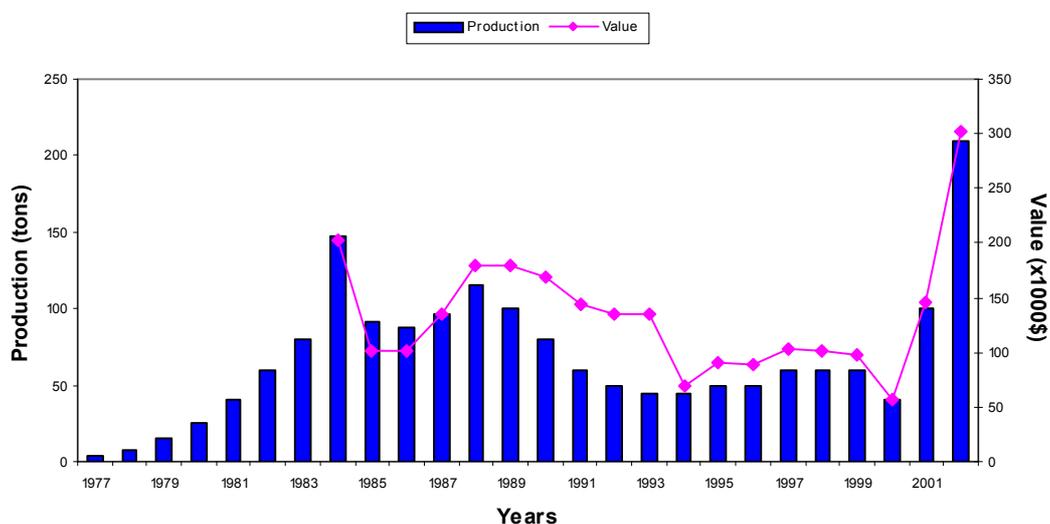


Figure 1. Evolution of tilapia production (in tons) and value (\$US) by aquaculture in Cameroon.

### ***Tilapias production in Congo***

Aquaculture was introduced in Congo in the 1950s, with the support of fry production centres and development programmes which were in particular intended to ensure the training of the technicians and to produce alevins of tilapias for private fish farmers. Centres, such as that of Djoumouna, were equipped to make research. In 1958, 13000 ponds were built, of which 8400 were in production. The farmers thereafter gradually took no further interest in the aquaculture activity because of the lack of technical and economic results, in spite of tests of revival by various development projects.

From 1981 to 1991, the sector of aquaculture profited from a significant assistance within the framework of UNDP/FAO project "Development of rural aquaculture". Among the activities of this project, which related to especially research and training, the tests of aquaculture in production ponds were carried out. The objective of these tests was to popularize adequate techniques for any private fish farmers. The principal works concerned feeding, the fertilization of the ponds, the artificial reproduction and the rearing tilapia fry, especially the species *Oreochromis niloticus*. Tests of production were also carried out in combination with the predatory ones such as *Clarias gariepinus*.

In the zone farmed by UNDP project, the outputs of the fish farmers shifted from 1 t/ha/an in 1982 to 2.7 t/ha/an in 1989. For the same period, the percentage of fry produced by the fish farmers themselves, increased significantly, passing from 5% to 41%. The

production of tilapia thus shifted from 50 tons in 1983 to approximately 250 tons in 1989 (Fig. 2). However, for lack of follow-up, the production, after having stagnated around 250 tons between 1989 and 1991, fell in 1994 to 100 tons. And since 1999, the production stagnates around 200 tons per annum. The financial value is not always correlated with the produced quantity. It depends of the selling price which is a function of the size of the individuals but also of the prices of fish produced by fishing. The contribution of tilapia production by aquaculture in Growth Domestic Product was estimated at 340 000 \$US in 2002 (FAO, 2002).

The country however has many favourable aquaculture zones adequate for the development of a family aquaculture in arranged ponds. This aquaculture, if it is supported by fry production centres, could release from the relatively high outputs. In certain areas of the country, the potential is estimated at more than 2000 tons/year.

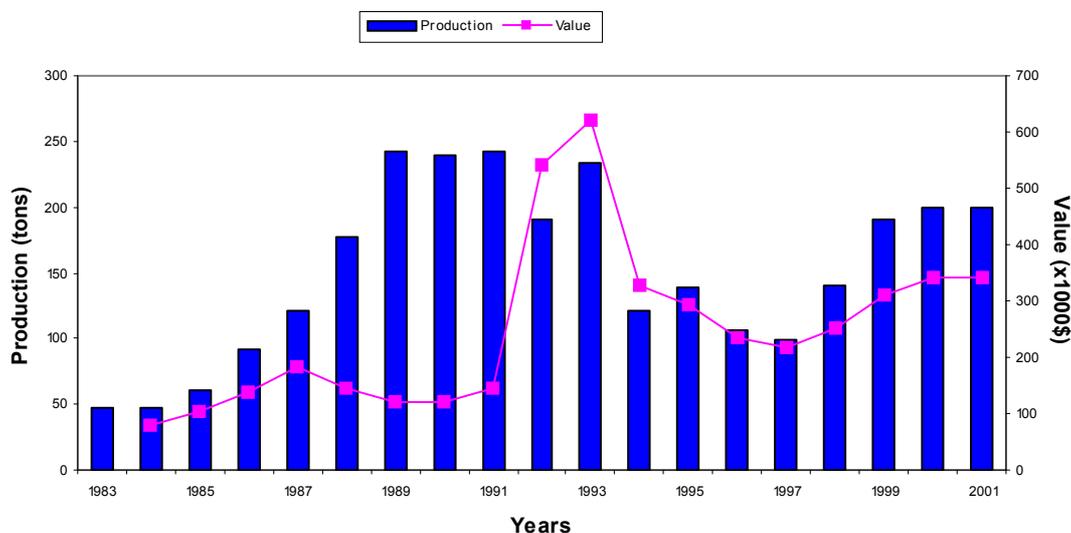


Figure 2. Evolution of tilapia production (in tons) and value by aquaculture in Congo.

### *Tilapias production in Gabon*

The fish production by aquaculture is limited to tilapia culture, practised on a small scale around the big towns. The development of this production encounters enormous structural difficulties such as lack of a national agricultural channel which would give way to integrated activities and access to food at prices compatible with the value of the end product, and insufficient skills in hydraulics and techniques of breeding. The largest breeding facility, located in High Ogooué (Sodepal, subsidiary of Comilog) and which were subject of significant investments, produced only a few tens of tons.

The production of tilapia by aquaculture remained very marginal for a long time. It is only in 1994 that the culture activity of tilapia started again. It grew gradually and reached its highest level in 1999-2000 with a production estimated at 550 tons (Fig. 3). It relapses

again into about 120-150 tons per annum currently. It should, however, be announced that compared to other countries of the same area, Gabon has less potentiality. Therefore, the existing potential was not exploited on an optimal level. However, this production contribution in Growth Domestic Product was estimated at 1 329 000 \$US in 1999 and 976 300 \$US in 2000 with the same quantity (FAO, 2002). The financial value is not always correlated with the produced quantity. It depends of the selling price which is a function of the size of the individuals but also of the prices of fish produced by fishing.

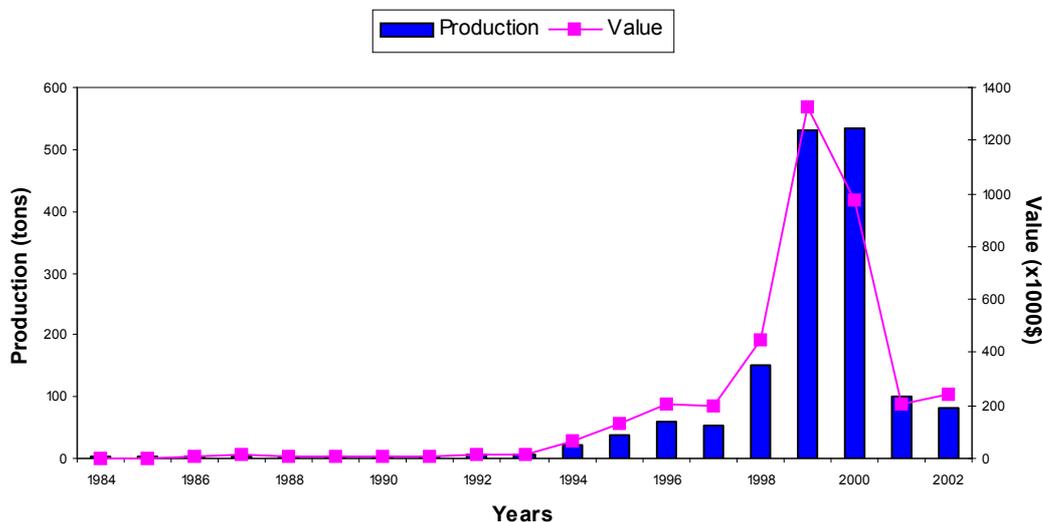


Figure 3. Evolution of tilapia production (in tons) and value (\$US) by aquaculture in Gabon.

### ***Tilapia production in Democratic Republic of Congo***

The first tests of aquaculture in DRC are in the years 1940 and 1945. The fish were collected in the rivers and water reserves in the province of Katanga. Thereafter, several fry production centres, approximately 45 with an output of 10,000 tons alevins per annum, were created to provide for the needs of the 15,000 fish farmers of the country. The number of ponds was estimated at more than 126,100 covering a total surface unit of approximately 9000 ha. However, after the accession of the country to the independence in 1960, the politico-economic situation of the DRC, majority of the fry production centres gave up or were badly exploited. That had enormous negative drawbacks on this activity. The average fish production, which was 0.45 t/ha/year fell abruptly to less than 0.035 t/ha/year. This fall of the production was explained partly by the hasty departure and without transition of the Belgian supervisory staff after the independences, the inexperience and the insufficiency of the national expertise and especially the various movements of wars and rebellions.

In the 1970s, several projects financed by bilateral co-operations (French Agency of Development, USAID, Belgium Technical Cooperation Agency) tried to start again the fish productions. This resumption of the production especially was the work of the American

Peace Corps. Thus, approximately 4000 ponds were rehabilitated with an annual production estimated at 3000 tons. These data do not appear however in the international statistics concerning the aquaculture in DRC.

In 1980-1990, following the politico-economic situation of the country following different political disturbances, all these projects were stopped. The fish production fell again to around 700 tons until 1996 (Fig. 4). A significant restarting of the aquaculture activity was observed in this year. The national production, in constant growth since then, is estimated today at approximately 3000 tons of tilapias per annum. The contribution of tilapia aquaculture in Growth Domestic Product was the highest in this region. It was estimated at 7 397 500 \$US in 2002 (FAO, 2002).

DRC has an important aquaculture potential estimated at approximately 2 400 000 km<sup>2</sup>. The Congolese aquaculture rests primarily on the subsistence fish culture with a prevalence of the breeding of the tilapia (*Oreochromis niloticus* and *Tilapia macrochir*). It is particularly about an extensive aquaculture (mixed breeding of population in ground ponds (Kombozi Limbeya Bolomo, unpublished data).

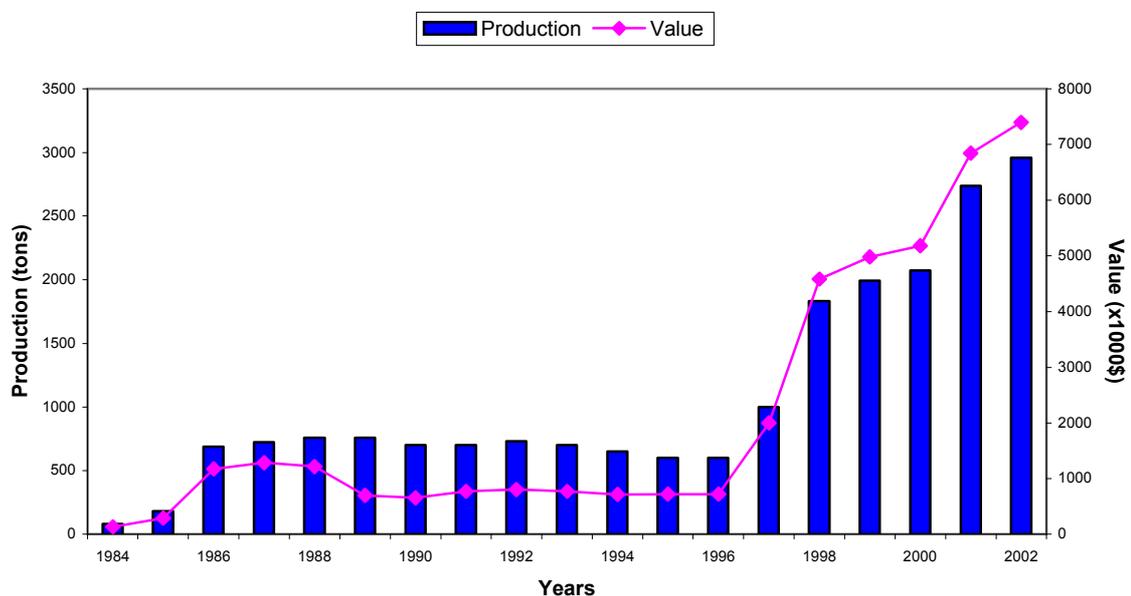


Figure 4. Evolution of tilapia production (in tons) and value (\$US) by aquaculture in Democratic Republic of Congo.

#### ***Tilapias production in Central Africa Republic***

Analysis of tilapia production by aquaculture reveals several cycles of increase and decrease. The production increased yearly up to 1984 and decreased significantly in 1987. The total production was estimated at 125 tons in 2002 (FAO, 2002). Concerning this country, few data are available on the aquaculture. The financial value is not always correlated with the produced quantity. It depends of the selling price which is a function of the size of the individuals but also of the prices of fish produced by fishing. The contribution

of tilapia production by aquaculture in Growth Domestic Product was estimated at 302 000 \$US in 2002 (FAO, 2002).

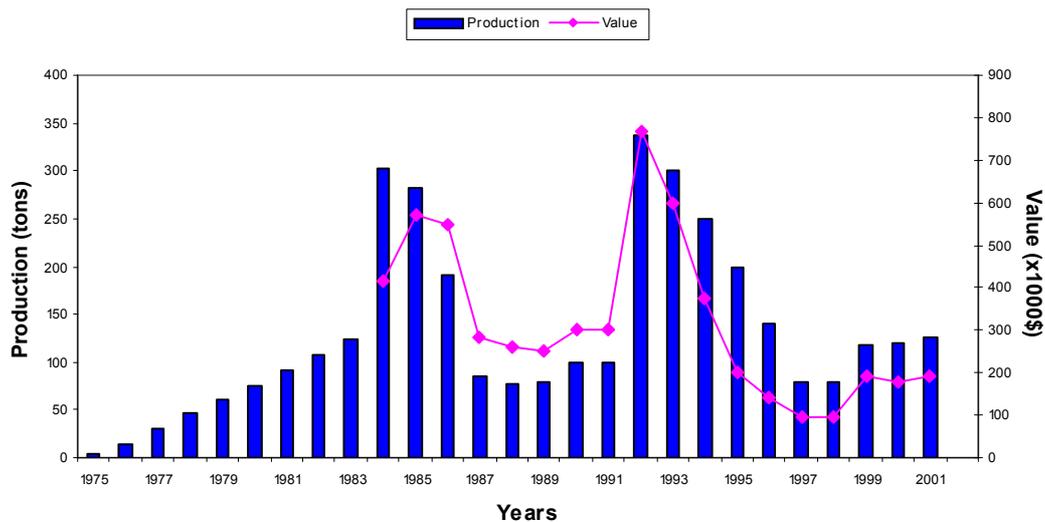


Figure 5. Evolution of tilapia production (in tons) and value (\$US) by aquaculture in Central Africa Republic.

### Conclusion

This region of Africa is characterized by abundant water and land resources for the development of an aquaculture industry, in particular tilapia aquaculture. But, most of the private farms that were established were small and practiced subsistence culture. There was very little understanding of pond management and most of the farmers practiced mixed-sex culture which led to the production of numerous stunted fish.

But, as seen in most of these Central African countries, tilapia production increased yearly at a steady rate this last decade. This can be explained by two things:

- Implication of the private sector with modes of more rigorous management
- The availability of the results of research (improved production technology, nutrition and feeding management)

Then, it is believed that this production will continue since new projects are still being undertaken by private farmers.

## **Acknowledgement**

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