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The main species of freshwater fish aquaculture interest in Morocco, current status and prospects

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Abstract

Morocco, Mediterranean country has a great geological, climatic and ecological and water potential. This feature gave it some interesting opportunities to develop its inland aquaculture. Since the introduction in Morocco of rainbow trout, for the promotion of sport fishing, fish farming of freshwater fish has diversified high fish dominated by cyprinids and salmonids, by mastering the techniques of their breeding and improving their diet, as well as a development plan biomass because fish production has increased from 2,500 tons in 2005 to 15 000 tons in 2013 and the objective is to reach 50 000 tons in 2024, this will have a major impact on the fight against poverty, job creation and food security.

Keywords: Aquaculture, cultured fish, freshwater fish, Morocco.

1. Introduction

Compared to other countries in North Africa, Morocco is the richest in continental freshwater [5, 4, 7]. However, despite this wealth of water, Morocco has a relatively poor fish fauna, which was accompanied, from the beginning of the last century by an introduction and acclimatization of new species series of tests in the waters Natural [6, 7]. So were imported European species, American or Asian [2] to ensure the development of sport fishing and commercial production in this country and develop ecotourism. The High Commission for Water, Forests and Desertification Control (HCEFLCD) proceeded from the twenties to the introduction of 35 species belonging to 9 families, but only a dozen species are now naturalized [4]. However, the results of more than three quarters of a century of action on the development of fish farming in Morocco is negative in relation to the quantities produced. Factors that may contribute to the development of inland aquaculture in Morocco there, mastery of livestock and improved with optimization of feeding these fish, as the fish feed are efficient and friendly environment [1]. Fish farming can be an engine and a development tool in helping to diversify production and increase incomes, generate employment and ensure food security.

This review to fish farming of freshwater fish in Morocco, revolves around a single component, since it presents the main species of freshwater fish currently cultured, and the prospects for development of fish farming in Morocco.

Fish farming in its current state in Morocco, is dominated by a modern operating very often structured. In this area with great potential for development, Morocco is endowed with several fish hatcheries refurbished where high fish species of fresh and brackish waters belonging to six families. The production of these fish is done in public and private fish farms, this production is for the repopulation of aquatic ecosystems to promote fishing, but also to the production of national and international commerce.

2. The cultured fish species

The nine species currently cultured in Morocco, belong to six major families of cold water and hot water; Cyprinidae, Salmonidae-Esocidae, the Centrarchidae, cichlids and Anguillidés that are either endemic or non-native fresh or brackish waters [8].

- ❖ The rainbow trout (*Oncorhynchus mykiss*), a species introduced since 1924, native to North America, for the promotion of sport fishing and trade. His breeding takes place at the station salmon Ras Elma Azrou, which aims restocking rivers and lakes, as well as the Ain Aghbal station in Azrou, for the production of commercial trout (portion size and portion fillet).
- ❖ The brown trout (*Salmo trutta macrostigma*), a species native. The purpose of his breeding is the restocking of rivers medium and high altitude, for the sake of sport fishing.
- ❖ The Pike (*Esox lucinus*), introduced specie, including fertilization takes place at CNHP center and developed at Amghass, for the purpose of sport fishing, commercial fishing, and for the regulation of populations of other species.
- ❖ Silver carp (*Hypophthalmichthys molitrix*), introduced specie, its breeding is intended to promote commercial fishing and the fight against eutrophication of dams in Morocco.
- ❖ Grass carp (*Ctenopharyngodon idellus*), non-native species, introduced in Morocco in 1983, in order to fight against eutrophication in the dams and irrigation and fish feed pure Black-bass channels.
- ❖ Common carp (*Cyprinus carpio*), a specie introduced in 1924, undemanding oxygen, it populates the majority of dams and natural lakes, the fish is intended to promote commercial fishing at the dam Almassira.
- ❖ The Black Bass (*Micropterus salmoides*) a species introduced at the beginning of the last century and perfectly acclimatized in Morocco. It is high in Deroua station in Beni Mellal, and deemed by sport and commercial fishing, indeed the fish begins to play a very important role in promoting fishing tourism in Morocco.
- ❖ The Nile tilapia (*Oreochromis niloticus*), a species introduced in 2004, from Egypt, fish recognized by its rapid growth and tolerance to the breeding, the most important species in the context of aquaculture North Africa, and one of the largest in the world. The breeding of this species is for the trade of consumption. His breeding is practiced by both the public and private sectors.
- ❖ The Anguilla (*Anguilla Anguilla*), endemic species, commercial interest, including breeding is intended only to countries in Europe and Asia.

3. Productions

3.1 Production systems

Three types of output are used for breeding these fish, namely the intensive system used mainly by private farms linked to production for direct consumption in semi-intensive tilapia production system, and the extensive system in the production of salmonids Cyprinidae, the Esocidae the centrarchids and cichlids (restocking).

3.2 productions

Figure 1 Shows production of fish from 2006 to 2013 and production targeted for 2024.

Production of freshwater fish in 2006 was estimated at 6,000 tons, in 2013 this production it was estimated at 13000 tons, for supplying rural populations in animal protein of high quality and contributing to the improvement of income of fishermen, generates a value sizeable market. The plan

referred by the High Commission for Water, Forests and Desertification Control (HCEFLCD) is to reach a production of 50,000 tonnes in the next ten years, knowing that the HCEFLCD is the largest producer of freshwater fish while the private sector remains limited production around 1000 tonnes per year.

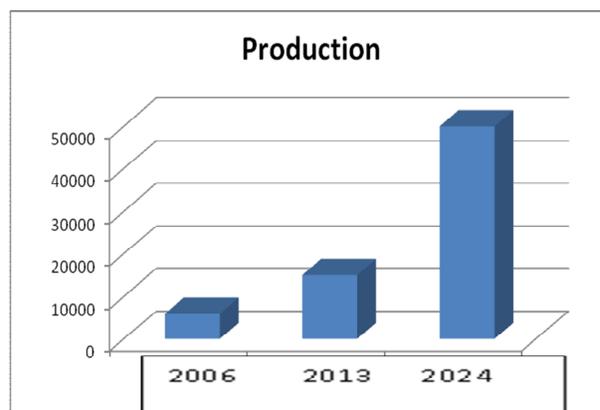


Fig 1: Evolution of fish production and prospects

3.3 Analysis of the current state

It appears from the analysis of this current fish farming has not yet reached a sustainable economic dimension in Morocco, either in terms of volume and in terms of place of this activity in the production systems, despite infrastructure public key, and also despite the mastery of fish farming, compared to agricultural products, which Morocco has an important place in the world.

The reasons for the poor performance of fish farming sector in our country are manifold; often linked to the absence of national and regional policies to promote fish farming, this can have a direct relationship with the fishery products, where Morocco is recognized by the marine fish production. In addition there is a predominance of the public sector and modest private sector involvement, knowing that the state investments made to date in this area are oriented towards the renovations of fish farms to develop the technical bases that make up the foundations of this business. Also since the distribution of fishery products are less developed within the country and eating habits, based on meat products, are more pronounced in rural areas. Similarly, Morocco is not a major consumer of fish products.

4. Prospects

In 2014, inland aquaculture in Morocco receives again a well-deserved attention, the strategy initiated by the High Commission for Water, Forests and Desertification Control (HCEFLCD) as a sector which can bring important contribution to the fight against poverty, food security, Prosperity of producers and well-being of consumers. Faced with the renewed interest in it, it is for all stakeholders to draw lessons from the past to promote the sector, which Morocco has great potential to succeed success.

Aquaculture becomes an integral part of rural development programs, large-scale sustainable production initiatives element, a means of income generation through the sale of goods or to direct employment and contribute to nation food security and household levels.

Aquaculture in the world continues to grow at a faster rate than any other sector of food products of animal origin pace

and exceeded population growth. Inland aquaculture, will undoubtedly meet new challenges in terms of quantities produced and high species diversity. Morocco has had a vast potential for development of inland aquaculture, despite the current low levels of production. In this context, Morocco has significant water resources (lakes, river, water dams and bodies) of this sector will present many opportunities, because of the variability of the aquatic environment and the variability of their physicochemical characteristics chemical and acclimation of many introduced species, which provides opportunities for the production of freshwater fish, many more original Asian, European, American or Egyptian species are well acclimated.

One advantage to win this challenge is the food for fish production, which finally happened in Morocco by the extrusion method is less polluting and environmentally, in addition, Morocco is a country where agriculture is well developed, the main raw materials for fish feed are readily available at reasonable prices. The fishing industry is well developed in Morocco, manufacturer and main exporter of fishmeal and fish oil. Morocco has all the attributes to mass produce a quality food and cheap for domestic consumption and export instead of import. Research efforts in the field of aquaculture feeds could also contribute to obtaining a Moroccan food suitable for the species, knowing that Morocco has adopted laws to respect the aquatic environment, and food aquaculture supplied to farmed fish properly meet the standards of the Act.

5. Conclusion

Consumption and increasing demand for aquatic products, and acclimatization of introducing aquaculture species that have enriched the fish fauna and the water wealth, climatic and geographical variations are real assets to support the ongoing development of inland aquaculture sector Morocco. The chances of developing this sector in Morocco are important. Mastering the technique of reproduction key parameter for improving the profitability of farming and our country has farmed structure renowned for the production of fish from cold and warm waters. Moreover, the availability of food suitable for food requirements of the species is a factor to develop this sector respecting the aquatic environment. Any time, to take advantage of this untapped potential harm, the development of aquaculture is currently part of the overall national and regional policy of Morocco, which will undoubtedly contribute to food security, the fight against poverty, and job creation.

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