FISHERIES OF BOSNIA AND HERZEGOVINA

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RIBARSTVO BOSNE I HERCEGOVINE

Abstrakt

Bosna i Hercegovina ima stoljetnu tradiciju proizvodnje ribe, čiji početak datira još iz rane Austrougarske vladavine. Iako je zemlja sa dugom tradicijom proizvodnje ribe, još uvijek proizvodnja i potrošnja su na vrlo niskoj razini. U ovom radu prikazana je proizvodnja ribe u B&H, proizvodnja (morske ribe i vodeni organizama, proizvodnja slatkovodne ribe, šarana i pastrve). Također u radu su obrađeni podaci o B&H uvozu i izvozu ribe, te je procjenjena potrošnja ribe u 2009. god., predstavljena je riblja bilanca.

Prelazak na tržišno gospodarstvo u Bosanskohercegovačkoj poljoprivredi (uključujući i ribarsku-akvakulturnu proizvodnju) utjecalo je na pad proizvodnje, smanjenje zaposlenosti, tehnološka zaostalost, zaduženost, pogoršanje bilance trgovinske razmjene i nelikvidnost. Ulaskom B&H u članstvo WTO dodatno je povećana i onako jaka međunarodna konkurencija. Strateški prioriteti se nužno moraju odrediti, te da se redefiniraju prioriteti u svrhu reorganizacije i prenamjene postojećih resursa voda prilagođavajući akvakulturu i ribarstvo načelima održive i ekonomsko opravdane iskorištenosti. Sustavom poticaja i stimulacija treba obuhvatiti sve osobito obiteljska ribarska gospodarstva, a preradu ribe treba podići na veću razinu i iskoristiti instalirane kapacitete te proširiti na nove subjekte i proizvode. U svrhu zadovoljenja osnovnih pretpostavki navedenih u ovom radu nužno je educirati postojeću strukturu uposlenih u akvakulturi, športskom ribolovu te izobrazbu i zapošljavanje visokostručnih kadrova iz slatkovodnog ribarstva. B&H je zemlja sa snažnim potencijalom voda za višestruko korištenje, osobito za proizvodnju kvalitetne slatkovodne ribe. Cjelovit režim iskorištavanja i gospodarenja podrazumijeva očuvanje i razvoj samoodrživog ribarstva, čija ponuda može zadovoljiti B&H potrebe, a realno može se i izvozno orjentirati, poštojući tržište i ekološke zakonitosti koristeći se njima za marketinšku promidžbu kao atraktivnog izvoznog proizvoda. B&H raspolaže sa 24 kilometra morske

obale, odnosno 1.400 hektara morske površine. Svakako da to nije veliki prostorni potencijal za razvitak marikulture, ali i kao takav on je još uvijek neznatno iskorišten.

Vodni potencijali B&H još uvijek nisu iskorišteni iako mogu predstavljati snažan izvor egzistencije stanovništva. U B&H je registrirano 46 poslovnih subjekata za proizvodnju konzumne ribe, od kojih 11 ima značajne objekte za proizvodnju mlađi. Tri subjekta su otpočela s preradom ribe. Pored registriranih subjekata, postoje i male obiteljske riblje farme, oko 100 ovih farmi imaju prosječnu proizvodnju 500-1.500 kg ribe. Od svih proizvodnih subjekata dva su na moru, dok su ostali na slatkim vodam, tekućim vodama i akumulacijama. Riba je prvi proizvod animalnog porijekla koja ima odobrenje za izvoz u EU.

Ključne reči: *B&H , ribarstvo, proizvodnja, uvoz, izvoz.*

INTRODUCTION

The records about organized fishing in Bosnia, dating from the early Austro-Hungarian rule are stating that the goverment`s first income from fishing came in 1882, and that the organized water quality protection and the legislature were introduced in 1886 (*Hamzić, 2003*). The beginnings of the economic fishing in Bosnia-Herzegovina are bound to fish farm "Vrelo Bosne", which was established in 1894. Development of carp fishing started in 1902, when a Polish citizen purchased land near Prijedor and Bosanska Gradiska and started building ponds.

There were 13 trout ponds in Bosnia in 1964, with a total area of 38 000 m^2. Intensive development of fisheries in B&H happened in 60- and 70-ies of the last century, when the largemouth fish farms were built with the capacity of 100-300 tons of fish/ year. In the 1987-1989 period B&H has produced 2 997 tonnes of freshwater fish which represented 13% of the then Yugoslav production. The carp ponds produced 2 155 tons of fish for the market or 11%, and 842 tons of trout (19%) of then Yugoslav production (*Kosorić et al. 1991*). The development of cage fish farming in B&H started in 1987. There were already 607 tonnes of rainbow trout produced in 1990. (*Mikavica et al. 2001*).

MATERIALS AND METHODS

The standard *Desk research* method was applied (Research at the table, *Bazala*, 1973) using secondary data, as well as information obtained from the companies engaged in the fish production in B&H. We used historical and normative methods that are common in the agroeconomic research. The historical method was used in order to study the chronology of events in fish production. The normative method was used for collection and processing of many secondary data and information quoted or reported in the literature. The relationship between total production and fish market, was studied using the balance-sheet method and the assessement of further development of domestic fisheries was made using forecasting method.

RESULTS AND DISCUSSION

The Adriatic Sea is a relatively poor in quantity but rich in fish species that inhabit it. Catch of marine fish in B&H is small; it is disorganized, not yet registered; and is performed by fishermen selling their catch to the local market, mainly restaurants. There

are 2 fish farms and shellfish in B&H sea area, each of 2500 m^2, with a total capacity of 300 tons and their production parameters are shown in Table 1.

***Table 1**. The total production of marine fish and shellfish (2005-2009) in tons*

Production	**Years**				
	2005	**2006**	**2007**	**2008**	**2009**
1/ Fish					
European seabass (*Dicentrarchus labrax* L.)	70	75	75	60	80
Gilthead seabream (*Sparus aurata* L.)	85	85	80	80	95
Catch	15	15	15	15	15
Total fish	**170**	**175**	**170**	**155**	**180**
2/ Shellfish	65	65	66	70	70
Total (fish and shellfish)	**235**	**240**	**236**	**225**	**250**

***Source:** Documentation of the company ''Ancora ''and ''''Karaka and Herzegovina - Neretva County*

Production has increased significantly since 2005, so the total aquaculture production in 2009 reached 250 tons, and the catch was estimated to be 15 tons.

The cyprinid ponds are located in the northern plains of B&H in the Republic of Srpska. The production areas of the carp ponds are about 2800 ha (organized in 6 ponds), and the estimated size of the small ponds is about 500 ha. The production of carp (*Cyprinus carpio* L.) for the period 2005-2009 is presented in Table 2.

***Table 2.** Production of carp in B&H from 2005 to 2009. in tonnes*

Production	**Years**				
	2005	**2006**	**2007**	**2008**	**2009**
Republic of Srpska					
Organized ponds	2.785	2.925	2.894	2.815	2.699
Small ponds	270	290	290	290	300
Federation of B&H					
Small ponds	100	120	120	130	130
TOTAL	**3.155**	**3.335**	**3.304**	**3.232**	**3.129**

***Source**: Statistical Office of the Republic of Srpska, 2010. - Organized ponds; for small ponds - estimates.*

Production areas of carp ponds in the period 2003-2009 increased by 554 ha.

In salmonid fish farms is predominantly grown rainbow trout (*Oncorhynchys mykiss* Wal.), as well as some spawn and brown trout (*Salmo trutta* m. *fario* L.). A significant portion of production is realized in classical fish farms and in the cage fish farming system in hydro accumulations (HA) Bocac, Bileca, Rama, Grabovica, Salakovac and Mostar, with the evident growth trend (Table 3).

Table 3. *Production of salmonid fish in running waters and HA in B&H (2005-2009) in tons*

Type of fish	Year				
	2005	**2006**	**2007**	**2008**	**2009**
*Federation of B&H**	1.560	1.611	1.768	2.046	2.257
*Republic of Srpska***	1.070	1.151	1.276	1.609	1.594
Total	**2.630**	**2.762**	**3.044**	**3.655**	**3.851**

Source: **From the manufacturer's documentation and documentation HNC (2010), **Department of Statistics RS (2010).*

Production of salmonid fish (mostly rainbow trout) in running waters and the HA has reached 3851 tons in 2009 (42 % in the Republic of Srpska and 58 % in FB&H). It was estimated that there are about 100 small ponds in B&H, with capacity of 500-1500 kg.

There is no commercial fishing in B&H. According to data from SRS B&H there are 13200 fishermen registered in Federation, and 14020 in RS, with estimated annual catch of 433 tons of fish or 15,67 kg/fisherman - average of 2003-2009 period (*B&H Sports Fishing Association, 2009*).

The total fish production in B&H is presented in Table 4, showing that salmonid fish species (mostly rainbow trout) account for about 41 % of total production, cyprinids (carp and others) account for about 50%, marine fish (sea bass and sea bream) and other sea organisms account for 3,2%, and 5,5% accounts for fishermen catch. Total production in 2005-2009 period increased by 21%, and the increasing production trend is continued.

Table 4. *The total fish production in B&H (2005.-2009) in tonnes*

Type	**2005**	**2006**	**2007**	**2008**	**2009**
Freshwater fish - cyprinids	3.155	3.335	3.304	3.232	3.129
Freshwater fish - salmonids	2.630	2.762	3.044	3.655	3.851
The catch of sport fishermen	-	-	428	444	426
Saltwater fish	170	175	170	155	180
Other marine organisms	65	65	66	70	70
Total	**6.020**	**6.337**	**7.012**	**7.556**	**7.656**

Source: *From the manufacturer's documentation and documentation HNC (2010), Department of Statistics RS (2010).*

The total fish production could certainly be higher if the hatcheries could provide enough quality spawn, and if smaller producers could find an easier way to supply fish food which is nowadays entirely imported at much higher prices.

B&H in its official economic policy is proclaiming an open and competitive market of products and services. The demand unmet by domestic production, produced a high and diverse range of imported food products and fish.

***Table 5**. The quantities of imported fish in B&H*

Year	Quantity (tons)	The value of BAM
2005	8.582,18	31.841.685,00
2006	14.885.28	52.134.381,85
2007	14.821,60	56.420.852,51
2008	16.808,62	67.033.450,26
2009	15.697,94	62.867.912,10
2010	13.963.50	57.858.798,92

***Source:** Indirect Taxation B&H, 2010.*

B&H represents a small consumer power in the European and world relations, but that does not affect presence of many countries offering a wide range of fish and fish products, among which are especially prominent Croatia, Germany and Slovenia. Countries from which we import over 100 tons of fish are Spain, Thailand and Austria. The value of imported fish in 2008 amounted to 67 million BAM (Table 5), which was the largest amount in last 10 years, and the import of fish almost tripled compared to 1999. As for the amount of imported fish to B&H, Croatia is leading with 47,4%, then Slovenia with 18% and Germany with 10,7%. Import of marine fish and other marine organisms seems to be almost 100%, of which about 89% in sea fish, 5% in marine fish fillets. The remainder consists of mollusks, crustaceans, molluscs and other marine fish products. B&H is a significant importer but also a small exporter of fish (Table 6).

***Table 6.** Quantities of fish exported from B&H*

Year	Quantity (tons)	The value of BAM
2005	1.739,67	6.294.547,00
2006	4.964,81	18.918.150,55
2007	4.086,09	18.054.514,53
2008	5.423,26	24.466.891,37
2009	4.975,69	22.945.066,47
2010	3.820,45	16.981.051,33

***Source:** Indirect Taxation B&H , 2010.*

The export of fish increased in quantity and value since 2006, and the main reason for this is the capacity-building for fish processing and packing. The main importers of fish from Bosnia are Serbia, Montenegro, Slovenia and Hungary.

In recent history, B&H is a permanent net importer of food and fish constantly being among the imported products. The negative trade balance of fish only mirrors the overall trade balance of food. On the other hand, the export of food, after an initial good growth, with some variations, is showing signs of encouragement, but on the whole it still remained small with strong barriers to development (*Selak et al.2003*). The import of fish does not exceed 1% of the total food imports in B&H.

***Table 7**. Values and quantities of imports and exports of fish in B&H*

Description	***2007***	***2008***	***2009***	***Index***
A/ Value in millions BAM				*2009/2007*
Import	56.420.852,51	67.033.450,26	62.867.912,10	*111*
Export	18.054.514,53	24.466.891,37	22.945.066,47	*127*
Balance	**- 38.366.337,98**	**- 42.566.558,89**	**- 39.922.845,63**	***104***
B/ Quantity in tonnes				
Import	14.821,60	16.808,62	15.697,94	*106*
Export	4.086,09	5.423,26	4.975,69	*122*
Balance	**- 10.735 ,51**	**- 11.385,36**	**- 10.722,25**	***100***

According to FAO estimates, the average fish consumption per capita for the period 1997-1999 was 1,6 kg in B&H (*FAO, 2000*); it was 2,8 kg for the period 1999-2001 (*FAO, 2003, 2005*), and 3,88 kg in 2007 (*Pavlicevic, 2007*). The evaluation presented in this paper was done using model applied in Croatia, where the consumption is automatically increased by 20-30%. Table 8 shows the total realized and by us estimated (increased by 25%) per capita fish consumption.

***Table 8**. Fish consumption in B&H*

Elements	**Year**		
	2007	**2008**	**2009**
Available at tons;			
a / Calculated	17.747	18.741	16.645
b / increased by 25 %	22.184	23.426	20.806
Present population in thousands	3.922	3.961	4.001
Consumption kg/capita			
a / calculated	4,52	4.73	4,16
b / increased by 25 %	5,66	5,91	5,20

***Source:** Authors' calculations*

Fish consumption per capita in B&H, even with an increase of 25%, thus providing the higher consumption of 5 kg/capita (Table 8), still remained rather low.

CONCLUSION

Bosnia and Herzegovina with its current production, meets only about 31% of its already modest consumer needs, and imports 69%, the import - export balance being negative in 2009 (-10 721 tonnes, or about 40 million). Fish consumption per capita is still quite small (5-6 kg/capita 2007-2009), although since 2003 significantly increasing.

Water resources, which relate only to the lake accumulations, provide opportunities for a strong development of aquatic production in B&H. Only with an increase in production in already built carp and trout fish farms (better use) and with fish from stagnant water, a significant market surplus of fish and products can be created.

Fishing, with full economic, technological, environmental, social and other arguments can stand out as an important branch in the general development of the domestic food production. There are significant obsticles in the fishery development, the main problems being lack of favorable credit lines and insufficient incentives. Therefore, the scientific and professional approach, accompanied by the appropriate development strategies and legislations in B&H, would certainly be desirable, and it would put this area on the list of activities that should not wait for implementation.

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