

COMMERCIAL FISHERIES ON DANUBE IN SERBIA

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PRIVREDNI RIBOLOV NA DUNAVU U SRBIJI

Abstrakt

U radu se daje pregled slatkovodnog ribarstva sa aspekta upravljanja, eksploatacije ribljih resursa, tržišta ribom, legislative koja uređuje delatnost ribarstva, kao i problemi sektora ribarstva u Srbiji. Istraživanje i analiza privrednog ribolova na Dunavu kroz Srbiju (588 km toka) sprovedeno je prikupljanjem podataka ribarske statistike za period od 1948. do 2010. godine, njihovim unošenjem u elektronsku bazu i analiziranjem uz korišćenje različitih metoda. Statistički podaci uključuju ukupan ulov, ulov rekreativnog i privrednog ribolova, ulov privredno značajnih vrsta i alohtonih vrsta. Korišćenjem anketnog upitnika za ribare dobijeni su podaci o demografskoj strukturi ribara koji se bave ribarenjem kao osnovnom delatnošću, o sastavu ulova, koliko je ribarstvo perspektivna privredna grana i koji su problemi i potencijalna rešenja.

Većina ribara pripada starosnoj grupi koja je u opsegu od 45 do 50 godina. Privredni ribolov je važna ekonomska delatnost i predstavlja osnovni izvor prihoda za većinu ribara. Tržište slatkovodnom ribom je neuređena oblast koja zavisi od ličnog zalaganja i odgovornosti pojedinca koji ima interes u prodaji ribe. Ribarstvo na Dunavu u Srbiji je već dugi niz godina u procesu tranzicije ka tržišnoj ekonomiji.

Dugoročne fluktuacije hidroloških podataka (vodostaj) upoređivane su sa fluktuacijama godišnjeg ulova ribe iz Dunava kako bi se uočila eventualna međusobna zavisnost i uporedili njihovi trendovi.

Rezultati ovog istraživanja treba da posluže kao pregled stanja sektora sa svim postojećim nedostacima koje treba ispraviti u cilju što uspešnijeg upravljanja ribarstvom na Dunavu i ostalim rekama u Srbiji gde je zastupljen privredni ribolov.

Ključne reči: ribarstvo, Dunav, ulov, hidrologija, upravljanje resursom

INTRODUCTION

Fishery has a long tradition in Serbia, which is ingrained, expected, fixed activity of local population beside the rivers (Čaldarović, 2006). Irrational and disorganized utilization lead to the biological degradation and could disable the use of these resources in the form in which it existed prior to change (Simonović, 2005), which significantly threatens the economic function of resources. Commercial fishing in Serbia is allowed only on the Danube, Sava and Tisa Rivers, but there is the tendency to stream it to the Danube. Fishing waters in Serbia organizationally are divided in 6 areas (before 2007 there were 25 fishing areas), which are given to assigned users by the competition under defined conditions and legal obligations. Each fishing area is regulated by the type of fishing that can be performed, recreational and commercial, or only recreational. Fishing areas management is given to the public or private companies, fishing associations and fishing unions.

First statistic yearbook which included Yugoslav freshwater and marine fishery was published in 1953. Average annual freshwater catch in the years 1948 - 1952 in Serbia was 2284 t. Categorized fish species were common carp (*Cyprinus carpio*), wels (*Silurus glanis*), pike-perch (*Sander lucioperca*), sterlet (*Acipenser ruthenus*), northern pike (*Esox lucius*), nase (*Chondostoma nasus*), rudd (*Scardinius erythrophthalmus*), bream (*Abramis brama*) and second quality fish species as a separate group. According to findings restocking of the open waters have been done in the 1956, 1957. There were 1240 full time professional fishermen and 1023 half time fishermen. Statistics included market data like the quantities of fresh fish sold, processed, exported distribution of remaining stock of fish, and income from fishery. In 1969 there were 33 reporting units which collected information about fishery statistics which was submitted to the Statistical Office. Fish species included in the commercial catch statistics has been changed, some species were removed, but some introduced, alien species appeared. The list contained: danubian sturgeon (*Acipenser gueldenstaedtii*), stellate sturgeon (*Acipenser stellatus*), beluga (*Huso huso*), sterlet, common carp, bream, pike-perch, wels, asp (*Aspius aspius*) and second quality fish species. Alien species, prussian carp (*Carassius gibelio*), bighead carp (*Hypophthalmichthys nobilis*), silver carp (*Hypophthalmichthys molitrix*) first were noticed in the 1977 statistics data.

MATERIAL AND METHODS

Collecting of catch statistics implied importing of the basic historical data from the books of the catch statistics archived in the Statistical Office of the Serbia. From 2006 exists the full database about the catch of each fish species, number of recreational and commercial fishermen, and separated catch realized by each group. Introductory activities comprised field survey and interviews with commercial fishermen and employers in the fishmongers. 109 commercial fishermen found in 2010 and 2011 in the field were interviewed using questioners, in order to estimate the activity, intensity and mode of fish resources utilization in the River Danube and possible consequences on their abundance and structure. In addition, 35 fishmongers were interviewed. Acquired records were obtained by extraction of answers of interviewed fishermen and fishmongers processed using Excell and Statistica 5. analitical packages.

RESULTS AND DISCUSSION

Total catch statistics according to published data in the period between 1948 to 2010 is presented in Figure 1.

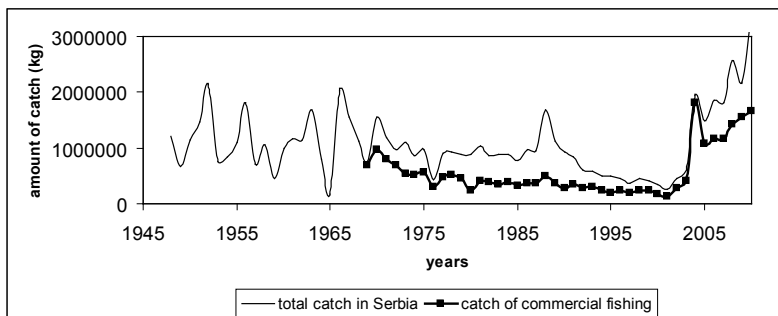


Figure 1. Trend in total fish catch in Serbia and catch of commercial fishing

The great oscillations characterize total catch in Serbia between 1948 and 1969. Reason for these oscillations may be natural fluctuations, but also insufficient data in some years. From 1969 commercial fishing is separately recorded from recreational. There is a clear follow-up trend and integration of both. 1990s decline in the catch may be, to some extent, the consequence of the political situation which led to a lack of statistical data. Poor catch statistics lasted until 2003. Since 2005, data collection methodology was changed, and recent reports showed bigger catches. Unfortunately, in the last 10 years fishermen were not obliged by the law to report their catches, so the statistical data are not quite reliable. Figure 2 presents species in the catch of commercial fishermen from 1969 – 2003. Second quality fish was removed because it substantially exceeds the average value of the catch of other species.

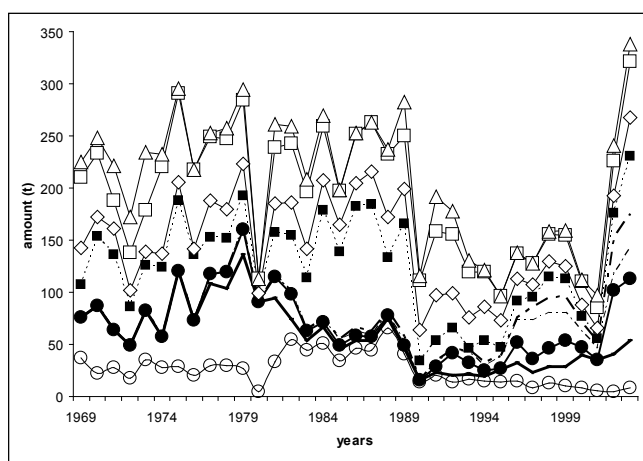


Figure 2. Commercial catch 1969-2003, Δ asp, \square wells, \diamond pike perch, - - \blacksquare - - bream, -- bighead carp, - - - - silver carp, — common carp, \bullet prussian carp, \circ sterlet

Statistics data for 2005 are missing, due to methodology changing, and the new catch data started from 2006. The increasing trend of second quality fish and alien species in the Danube catch in the last 5 years was perceived (Fig. 3). These species became common demand not only because of low prices but also because abundance and tasty meat.

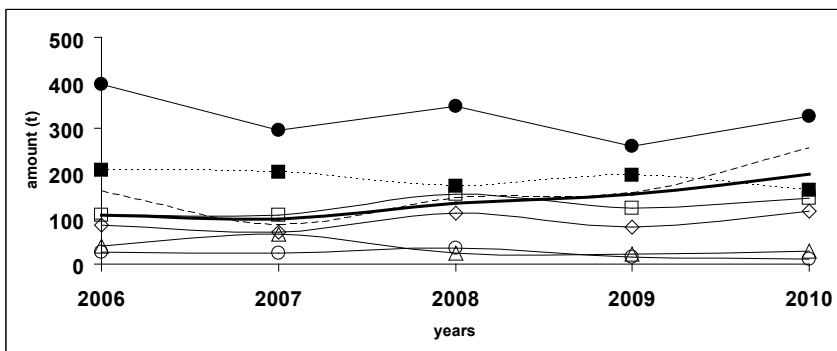


Figure 3. Commercial catch from 2006-2010, Δ asp, □ wells, ◇ pike perch, - - ■ - - bream, -- bighead carp, — common carp, ● prussian carp, ○ sterlet

Data on total annual catch were compared with annual fluctuations of Danube water level. Analyses of the regression between Danube water level and total annual catch for the entire period of investigation (1948 – 2009) did not show significant relationship ($r = 0.172$; $P = 0.18$). On the other hand, when only data for the period before Đerdap dam construction (1948 -1975) were analyzed (Fig. 4), highly significant relationship between water level and catch fluctuations was found ($r = 0.468$; $P < 0.01$). The reason could be both impact of dam and unreliable statistics of the catch after 1990s. Regarding statistics, before 1990s almost entire catch has been redeemed by the authorized public companies for reasonable price in accordance with the price of fishing license, and the fishermen had an interest to give total catch to purchase. However, significant correlation indicates that statistical data for that period were reliable.

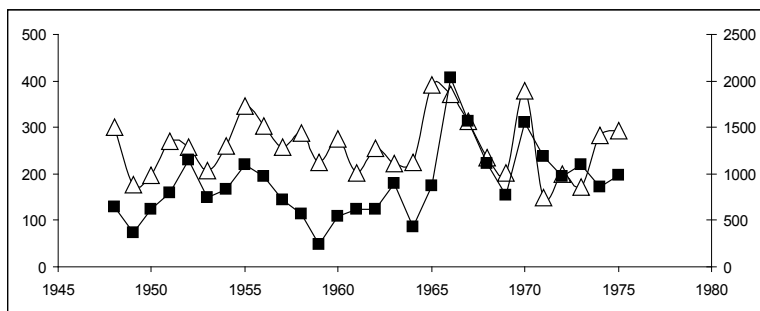


Figure 4. Δ Total catch (t) and ■ Danube water level (cm)

Number of commercial fishermen in Serbia is decreasing. In the period 1995-2004 numbers of registered commercial fishermen per year was around 1200 and more, but

in the last years number falls rapidly. Number of registered commercial fishermen on Danube in 2010 was 511. By the establishment of the new law of the conservation and sustainable use of fish stocks in 2011 number of commercial fishermen has dropped even more, mostly because very expensive permit which has to be paid at the beginning of the season.

Regarding demography features of the commercial fishermen, majority of fishermen belong to the age group between 45 and 50. They are mostly local citizens of the towns and villages on the banks of the River Danube. Fishing is the only source of income for them. They sell their catch in different ways: to personal customers, fishmongers, restaurants, markets. Fishing market is more or less out of control and depends on the personal responsibility. Purchase of fish and processing of fish products doesn't exist almost 20 years. There are just individuals who produce small quantities for personal use.

Commercial fisheries in Europe show a downward trend. This is result of many factors: increasing operational costs which lead to decreased profitability, increasing uses of water, pollutions, habitat degradations, aspiring to protection and conservation character, increasing international trade, aquaculture (Pintér, 2004).

Analyzing commercial fisheries in the Serbia, especially on the River Danube we noticed some of the general problems of the fisheries sector in Serbia. Due to the shift from centralized to market economy, there has been more expressed the development of the gray fish market (Lenhardt *et al.*, 2006). The main problems are poor fishery resource management and lack of organized purchase of the catch, namely the complete absence of buying fish caught. Thus, the fishermen were forced to self-navigate in the sale. This lead to rise of the gray fish market; and on the other hand, fishery statistics has become unreliable.

Poaching, the high cost permits for commercial fishing versus prices for sport fishing, lack of organized purchase of fish and additional problem negatively affect the market. Measures that could be applied to overcome these problems are regulation and control of fishing intensity, as well as economic support and incentives of individuals in the organization of fishing and selling. Some countries organized fisheries in the way to support a commercial harvest that is exported and marketed away. But for quantities of fish consumed locally, economic importance is harder to measure.

ACKNOWLEDGEMENTS

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