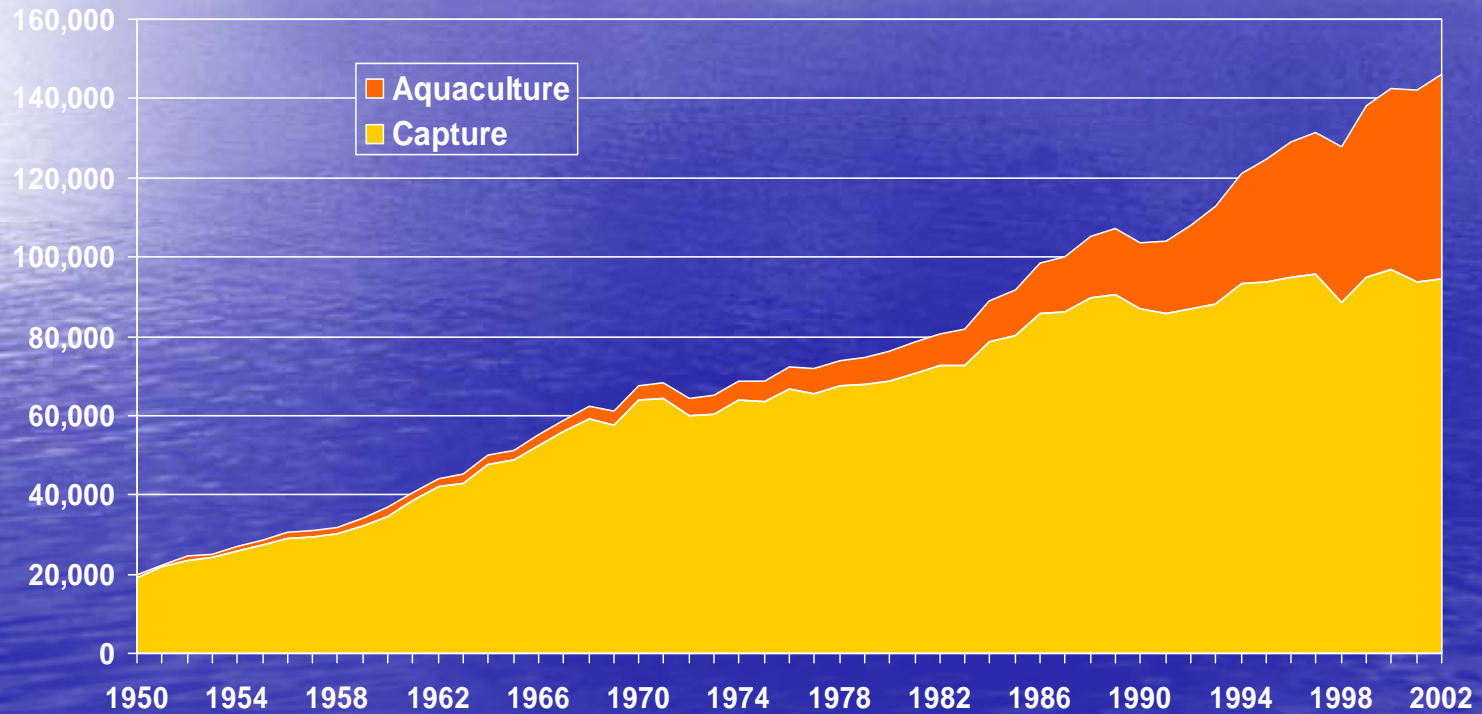


# CROATIA IN WORLD FISHERIES' TRENDS

# Trend svjetskog ulova i proizvodnje u akvakulturi

- u 1,000 tona -



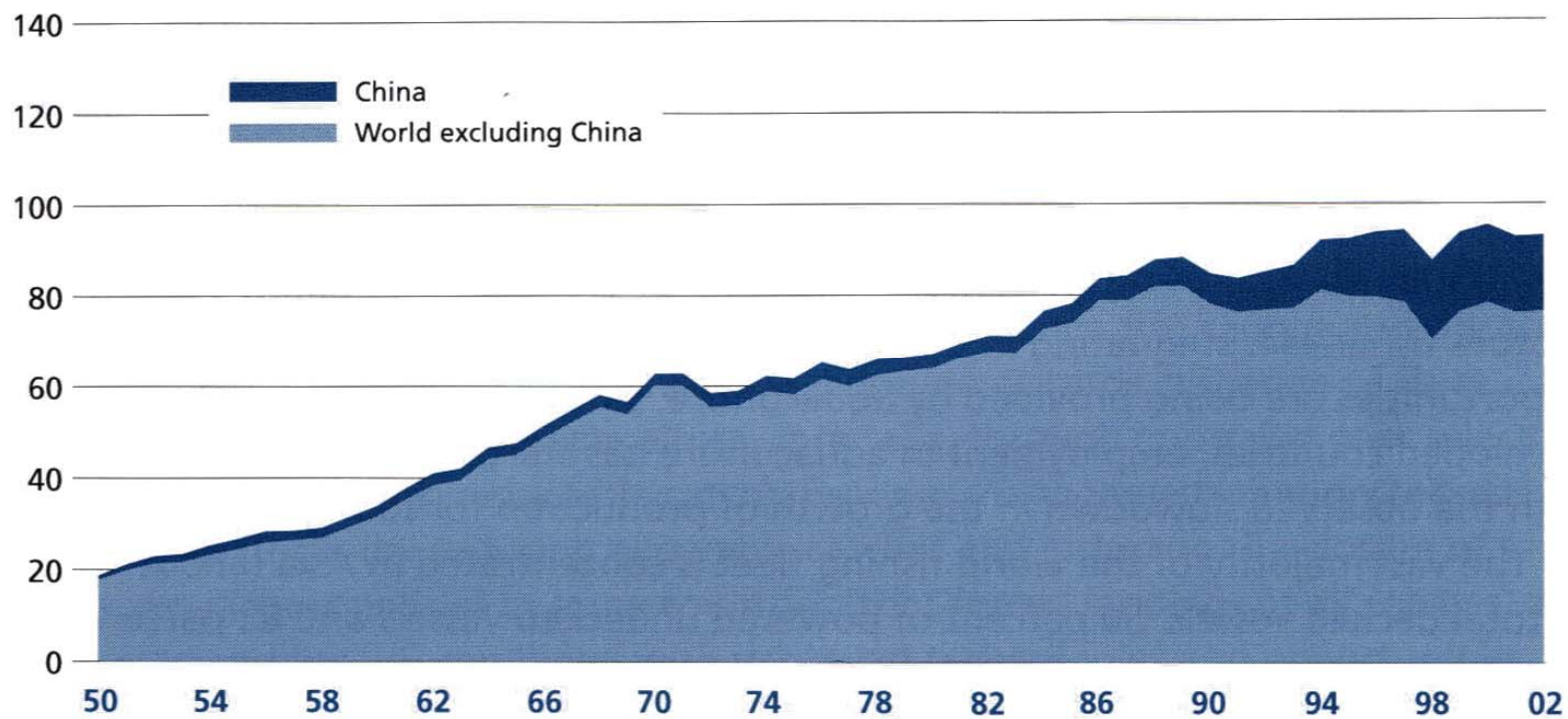
Izvor: FAO

3

**World capture fisheries and aquaculture from 1950 to 2002**

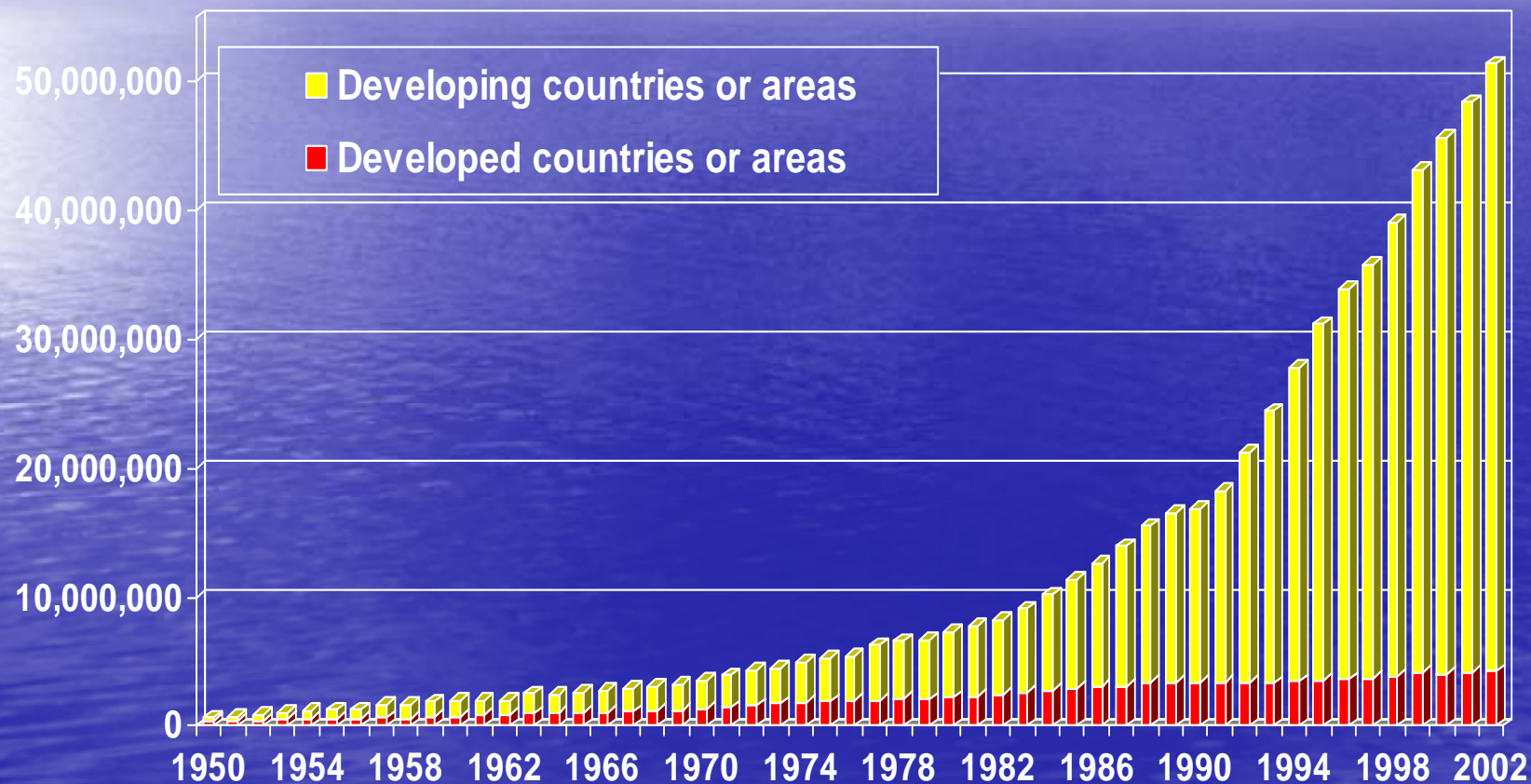
## World capture fisheries production

Million tonnes



<sup>1</sup> FAO. *The State of World Fisheries and Aquaculture 2002*. Rome, Box 2, p. 9.

# Trend porasta proizvodnje u akvakulturi – u tonama -



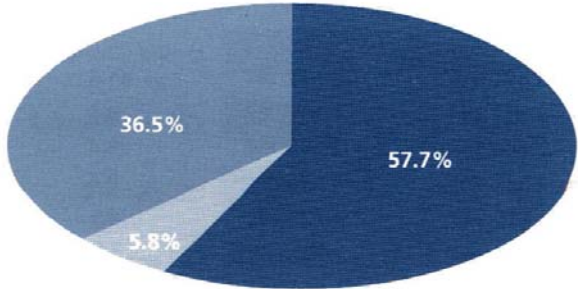
Izvor: FAO

- Growth of world aquaculture production in tonnes

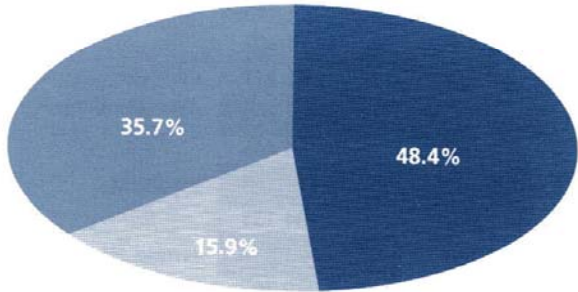
World aquaculture production of fish, crustaceans and molluscs in 2002:  
breakdown by environment

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QUANTITY



VALUE



- Freshwater culture
- Brackish-water culture
- Mariculture

Note: Data exclude aquatic plants.

# World Fisheries Congresses

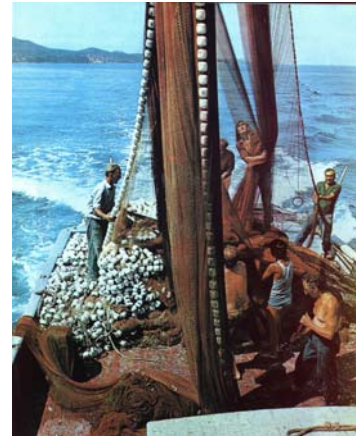
- 1st – 1992 – Athens, Greece
- 2nd – 1996 – Brisbane, Australia
- 3rd – 2000 – Beijing, China
  - “Fisheries as a **source of food** in 21st century”
- 4th – 2004 - Vancouver, Canada
  - “Reconciling Fisheries with **Conservation**: The Challenge of Managing Aquatic Ecosystems”
- 5th – 2008 – Yokohama, Japan
  - “Fisheries for Global **Welfare** and Environmental **Conservation**”





# Issues:

- **Overfishing:** World fisheries goes down in the food web – carnivorous fish overfished
- **Aquaculture explosion:** Based on fish meal – over 7 kg/1 kg
- **Conflict:**
- Developed countries – limit capture fisheries
- Developing countries – need for food; developed overfished for profit



# 4 basic questions and answers

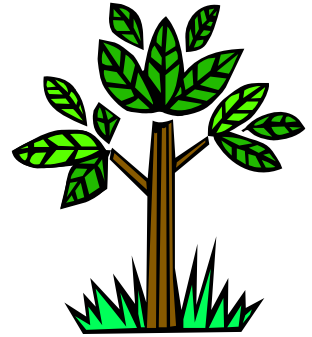
- **1. What to take care about** when reconciling fisheries with conservation?:
  - About human welfare.
- **2. Who owns the fish** and what is its wealth to the society?
  - Public! Only it can define the wealth.
- **3. Can we have more fish and profit and still have reconciling fisheries with conservation?**
  - From capture fisheries not, unless we renew the habitats. **From aquaculture yes, but only by culturing herbivorous fish**, not depending on fish meal
- **4. How to manage** water resources in order to reconcile fisheries with conservation?
  - Developing management which takes care about everything mentioned above.





# What is new?

- 1400 people
- One week
- “New is that the **conscious about the limits of fisheries** and about the conservation does not longer exist only among the individuals, but it became the generally accepted knowledge in fisheries’ scientific and expert world.”



# EIFAC/FAO/UN - Mondsee 2006

## Problems in Europe

- Drastic **reducing the number of eel** and sturgeon
- Causes: habitat destruction, overfishing, water pollution, air-bladder parasites, climatic change
- **Efforts: spawning** of European eel (like Japanese) and use in aquaculture, forbidden fisheries (in Romania for 10 years for sturgeon – “national sport”)

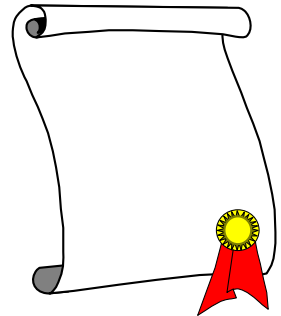


- **Organic aquaculture**: pro (demand) and contra (water saving, higher N and P pollution, **not clear definition**).
- Criteria: feed components, stocking density, fish health and welfare etc. – “eco-labeling”
- **Animal rights activists**: trying to compromitiate **angling and aquaculture** – even possible to forbid. Answer: **Humans are part of ecosystem**. Code of recreational fishing: “Recreational fishing is fishing conducted for leisure, with a possible secondary objective to capture fish for personal consumption, but not for sale or trade.”



# IUU (ILEGAL, UNREGISTERED AND UNREGULATED FISHING)

- Fishing with tools and methods not allowed
- Fishing out of fishing season and area
- Catch not registered
- Fish transfer
- Escapes from aquaculture (genetic pollution)



# Antalya '08 – EIFAC

## Social, Economic and Ecological Objectives of Inland

## Commercial and Recreational Fisheries and Aquaculture



# EIFAC 08 => EIFAAC



- MULTIFUNCTIONAL INLAND AQUACULTURE



- STRATEGY OF CROATIAN FRESHWATER FISHERIES



# Multifunctional uses of inland aquaculture:

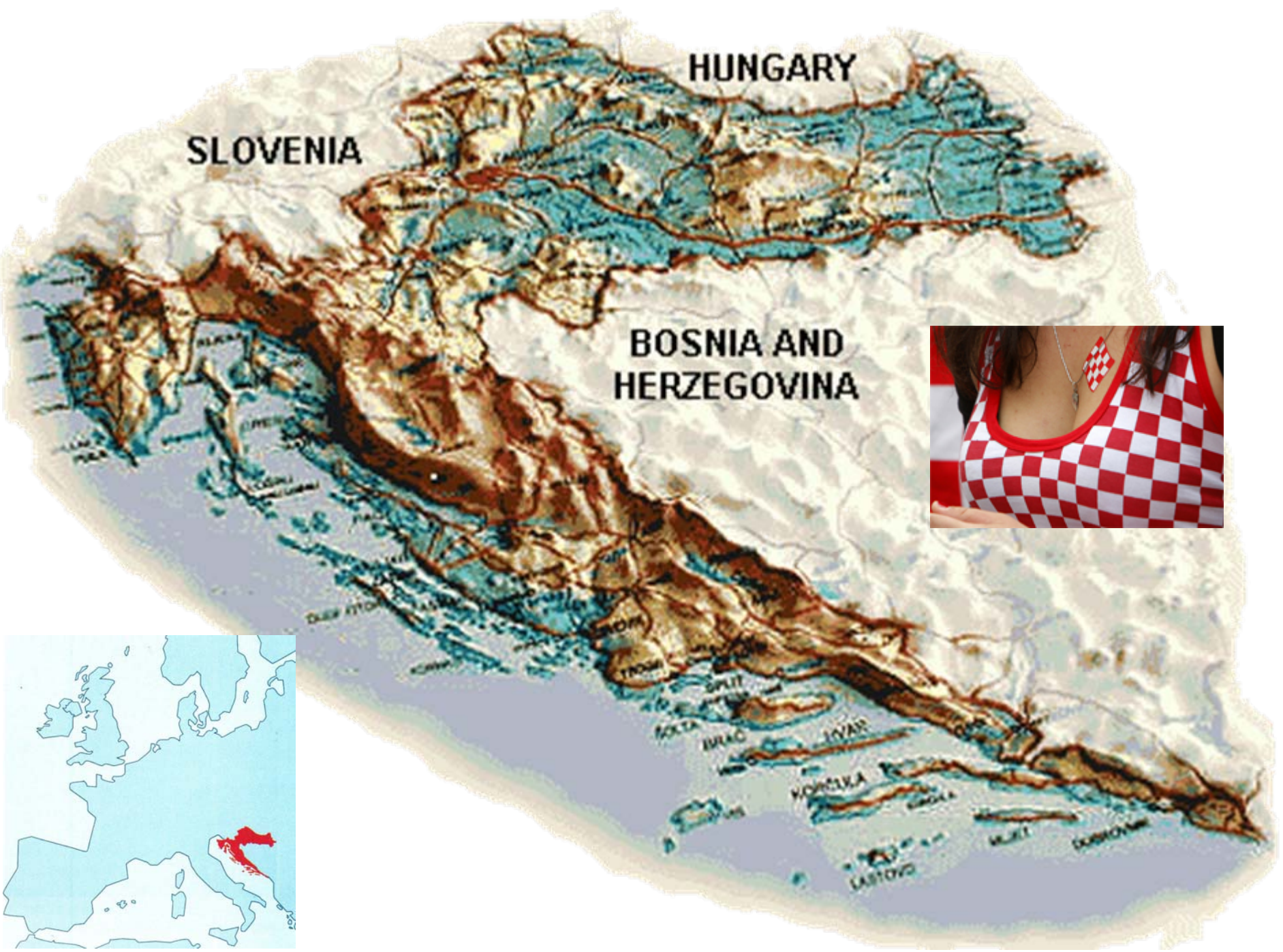
- - Better use of water and land resources
- - Functions in ecosystem and environment
- - Functions in rural life and economy
- - Providing the special food on the market



**SLOVENIA**

**HUNGARY**

**BOSNIA AND  
HERZEGOVINA**



# Number of commercial and sport fishermen in Croatia in 2007

Water	Group	Number
Adriatic sea	Commerical fishermen	3.748
Adriatic sea	Small fishermen	13.100
Adriatic sea	Sport fishermen (whole year)	23.400
Adriatic sea	Sport fishermen (1-30 days)	21.600
Freshwaters	Commerical fishermen	29
Freshwaters	Anglers	38.495

## Annual fish consumption (kg per capita)

([http://www.st.nmfs.noaa.gov/st1/fus/fus04/08\\_perita2004.pdf](http://www.st.nmfs.noaa.gov/st1/fus/fus04/08_perita2004.pdf))

- Tokelau 200,0
- Iceland 91,5
- Greenland 84,3
- Japan 66,1
- Portugal 57,4
- Norway 50,0
- China 25,4
- Italy 23,1
- Greece 22,7
- USA 21,3
- Russia 19,1
- Switzerland 15,4
- Austria 11,1
- Czech Republic 10,3
- Belarus 10,1
- Tanzania 7,4
- Croatia 7,4
- Hungary 4,1
- Colombia 4,1
- Mongolia 0,2
- WORLD 16,1

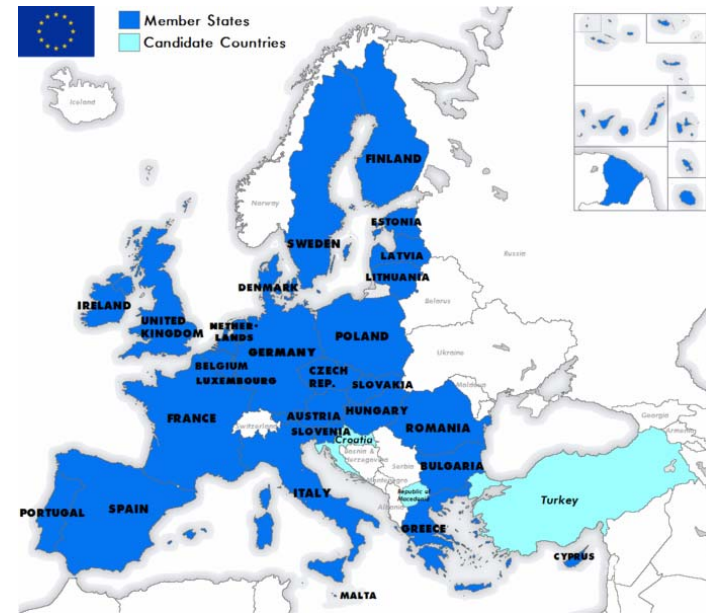


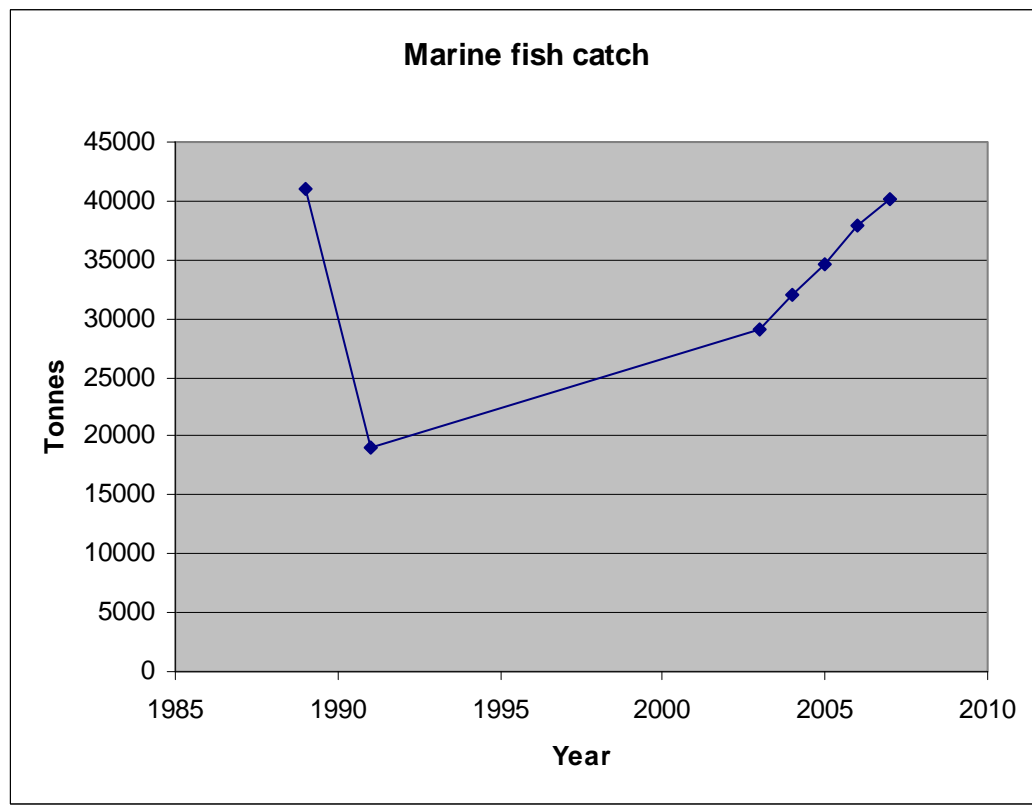
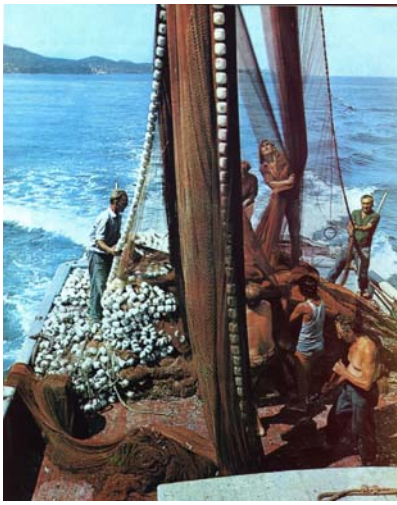


# COMMON FISHERY POLITICS OF EUROPEAN UNION

Fundamental principle:

- All waters and resources in them are common and should be used according to the non-discriminatory principle.
- Up to 31.12. 2012. territorial waters and their resources are excluded from this principle.





**Crayfish**



**Cephalopods**

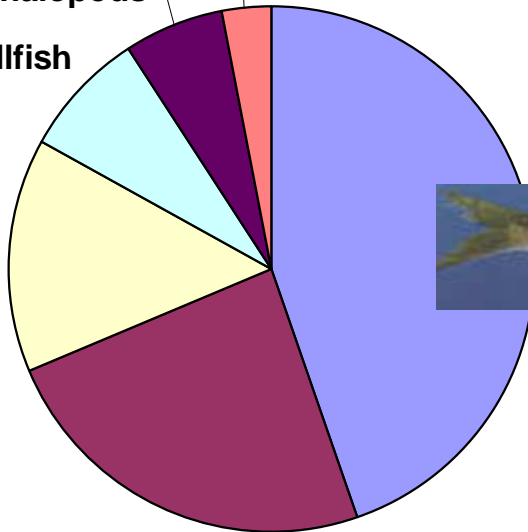


**Shellfish**

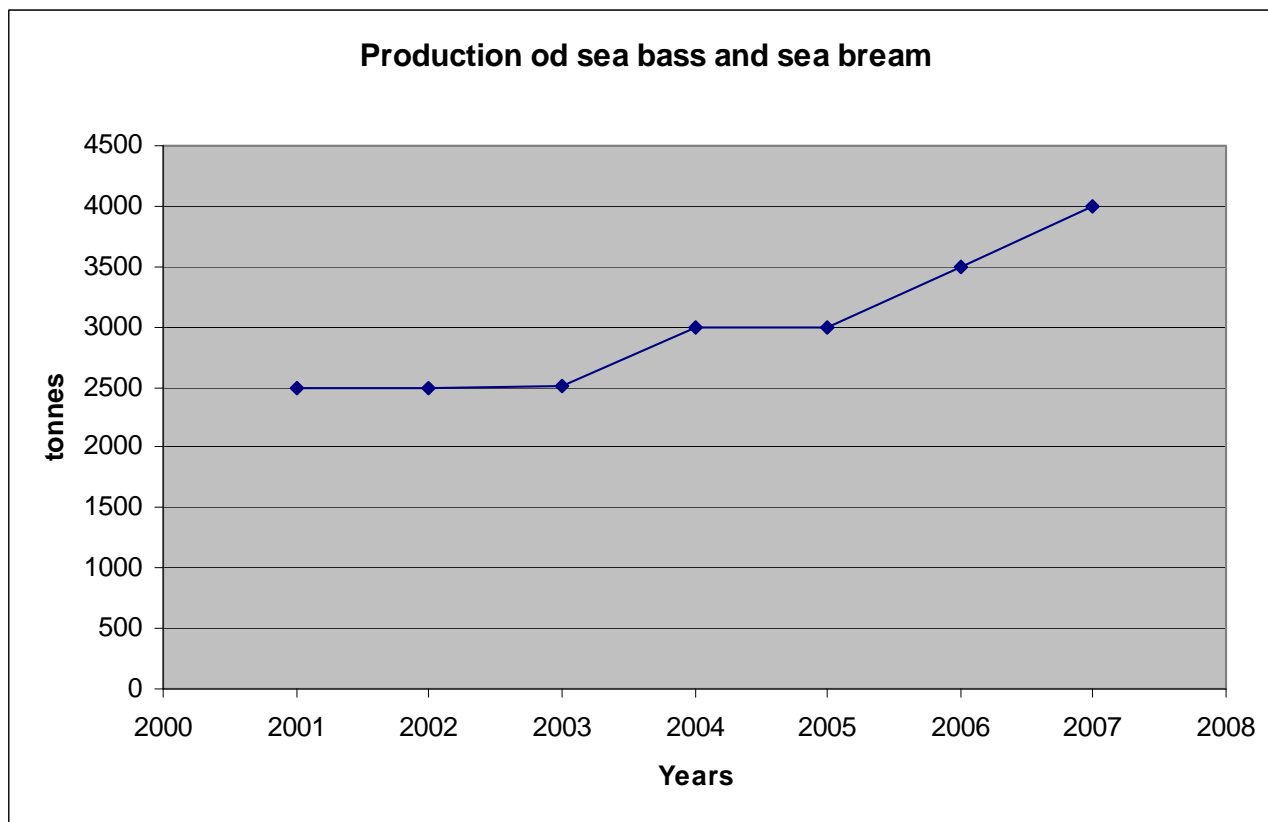
**Other pelagic fish**

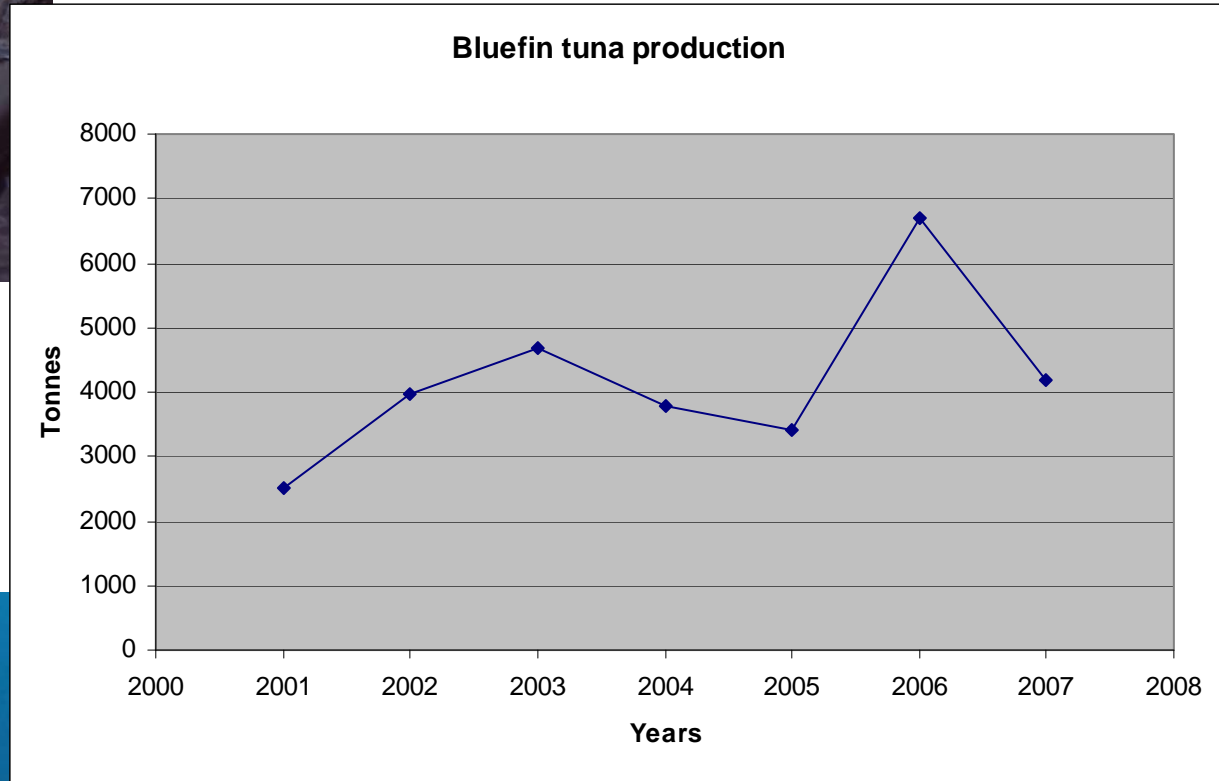


**Benthic fish**



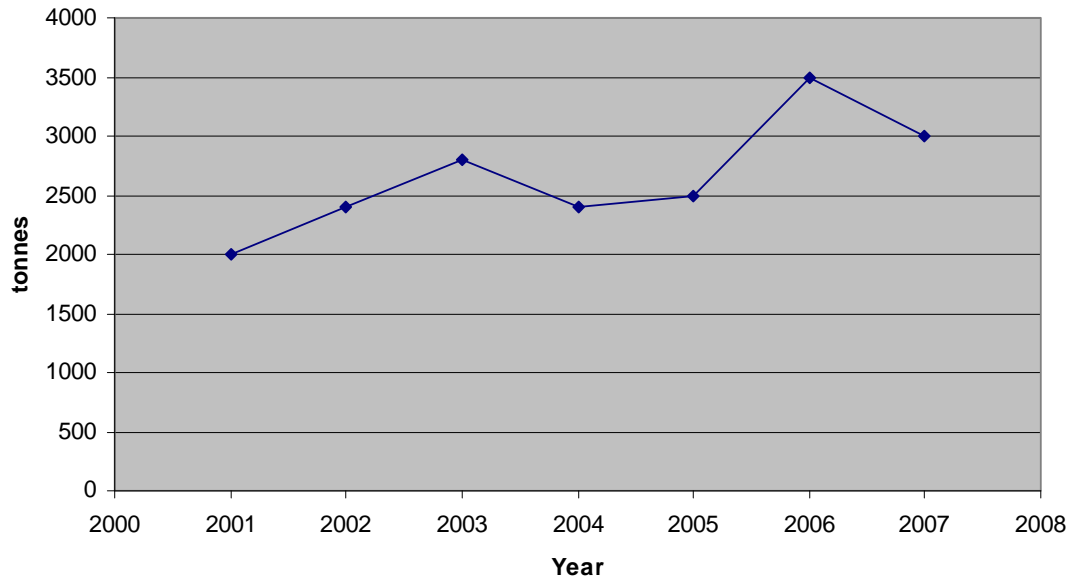




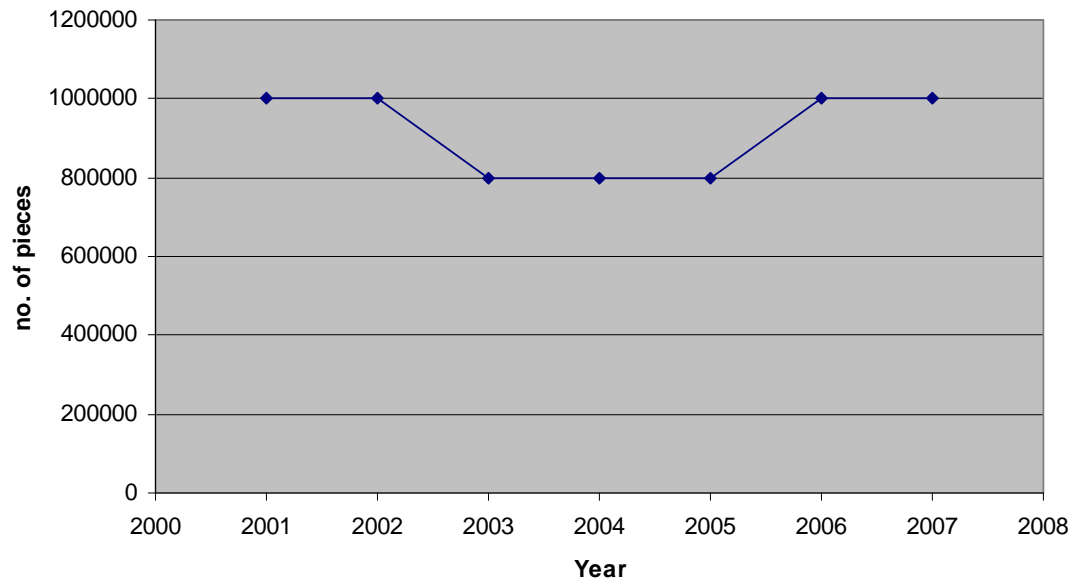


Avi Klapfer

**Mussel culture (in tonnes)**



**Oyster production (in pieces; around 50 t)**





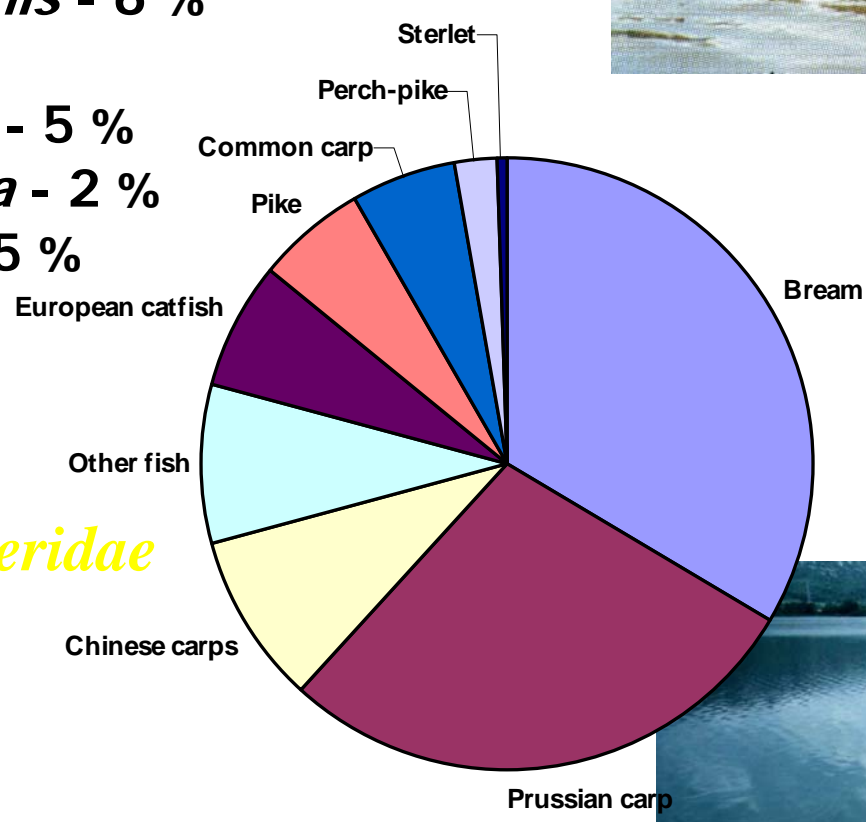
# Around 700 tonnes per year (29+40 000)

- Bream *A. brama* – 30 %
- Prussian carp *C. gibelio* – 25 %
- Chinese carps - 8 %
- Other fish – 7,5 %
- European catfish *S. glanis* - 6 %
- Pike *E. lucius* - 5 %
- Common carp *C. carpio* - 5 %
- Perch-pike *S. lucioperca* - 2 %
- Sterlet *A. ruthenus* – 0,5 %



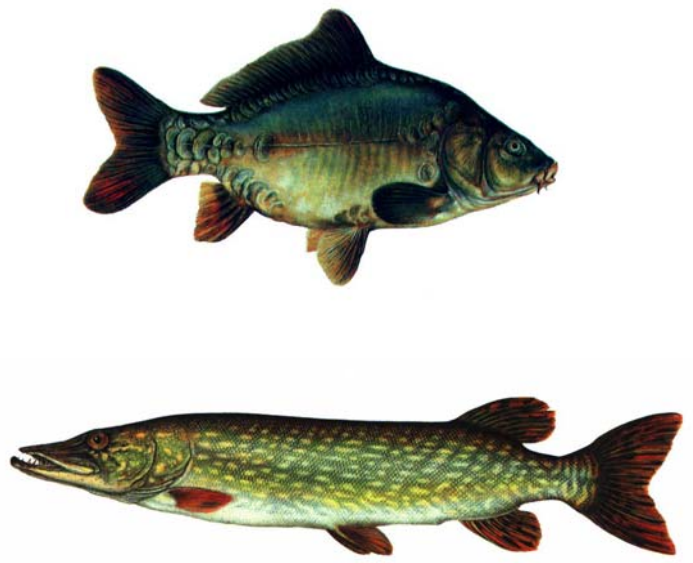
*Paraphonnus*  
*Leuciscus*  
*Salmo*  
*Salmothymus*

*Acipenseridae*

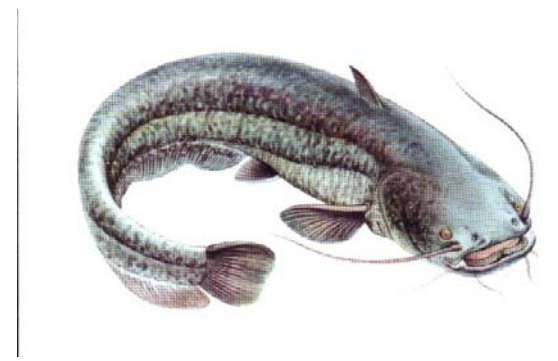
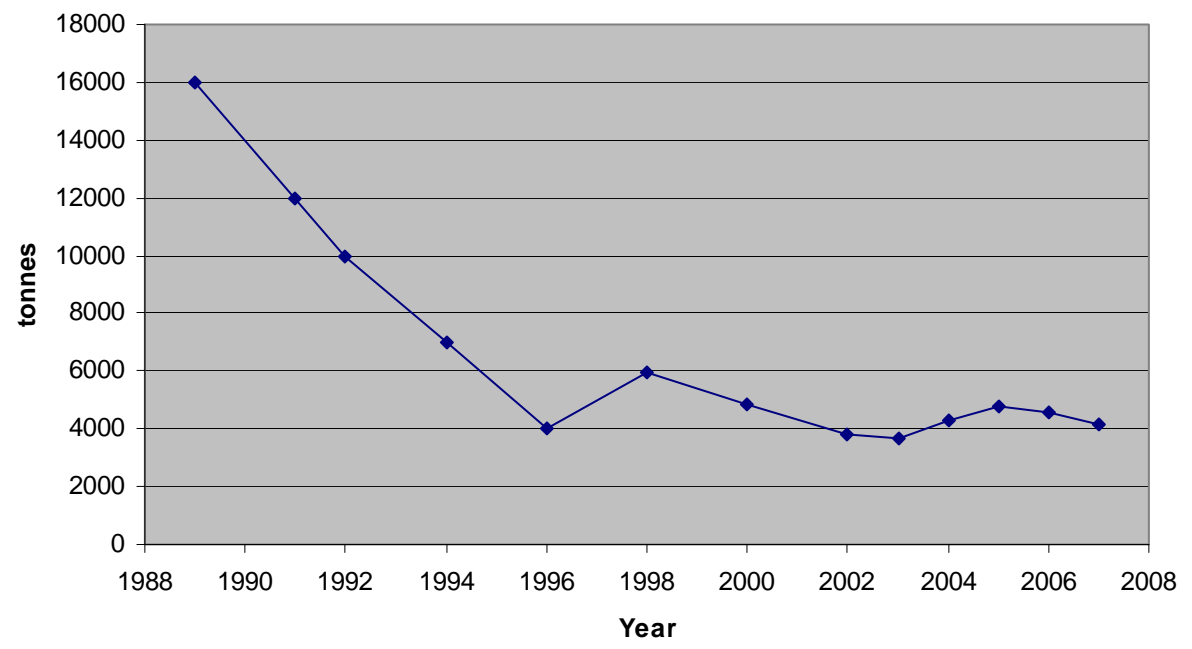


40 000



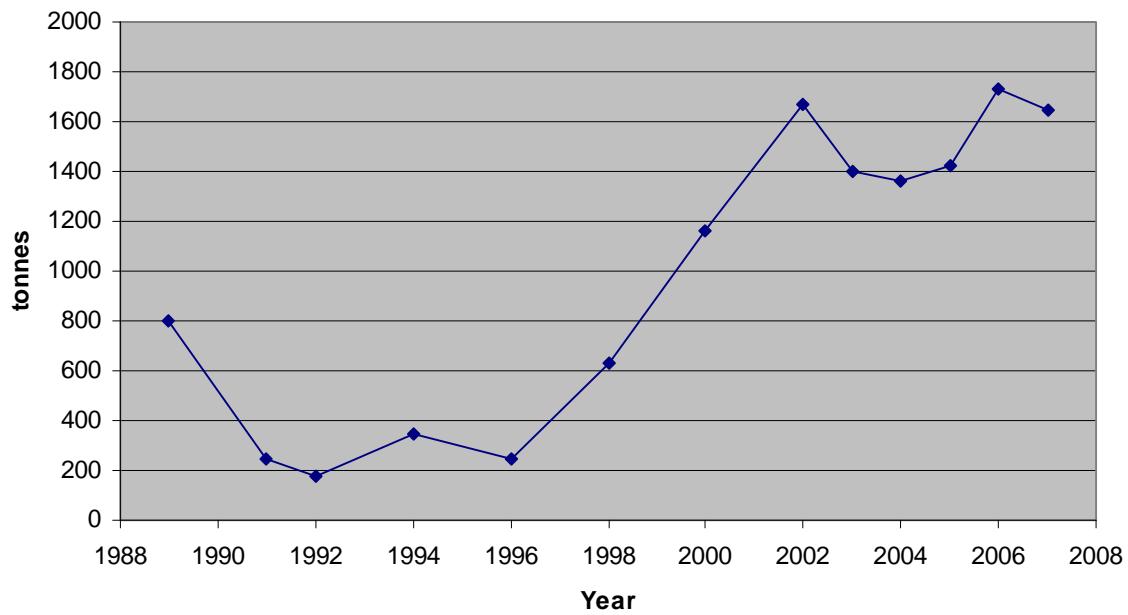


**Carp farms production in Croatia (t)**

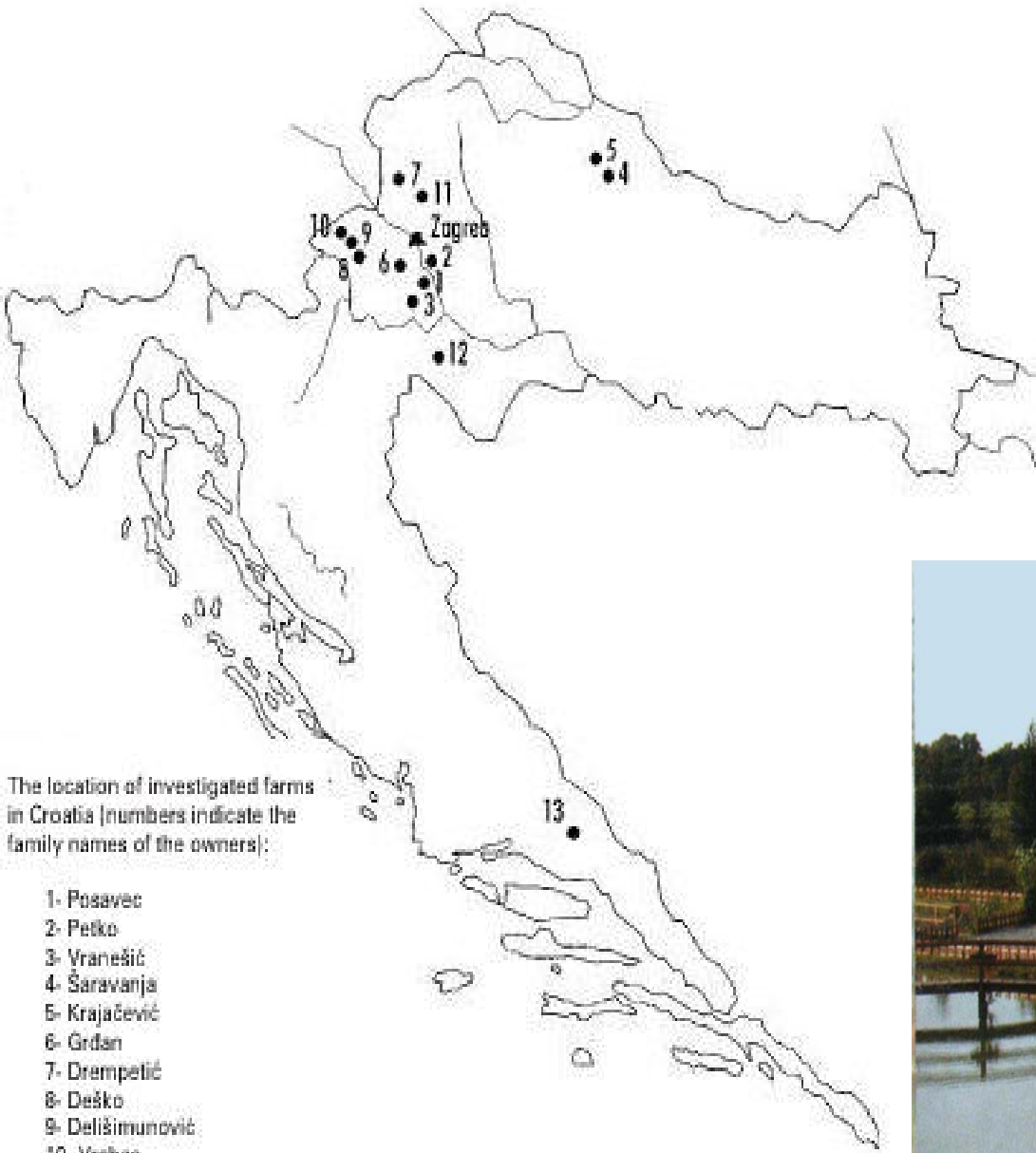




Trout farms production in Croatia (t)



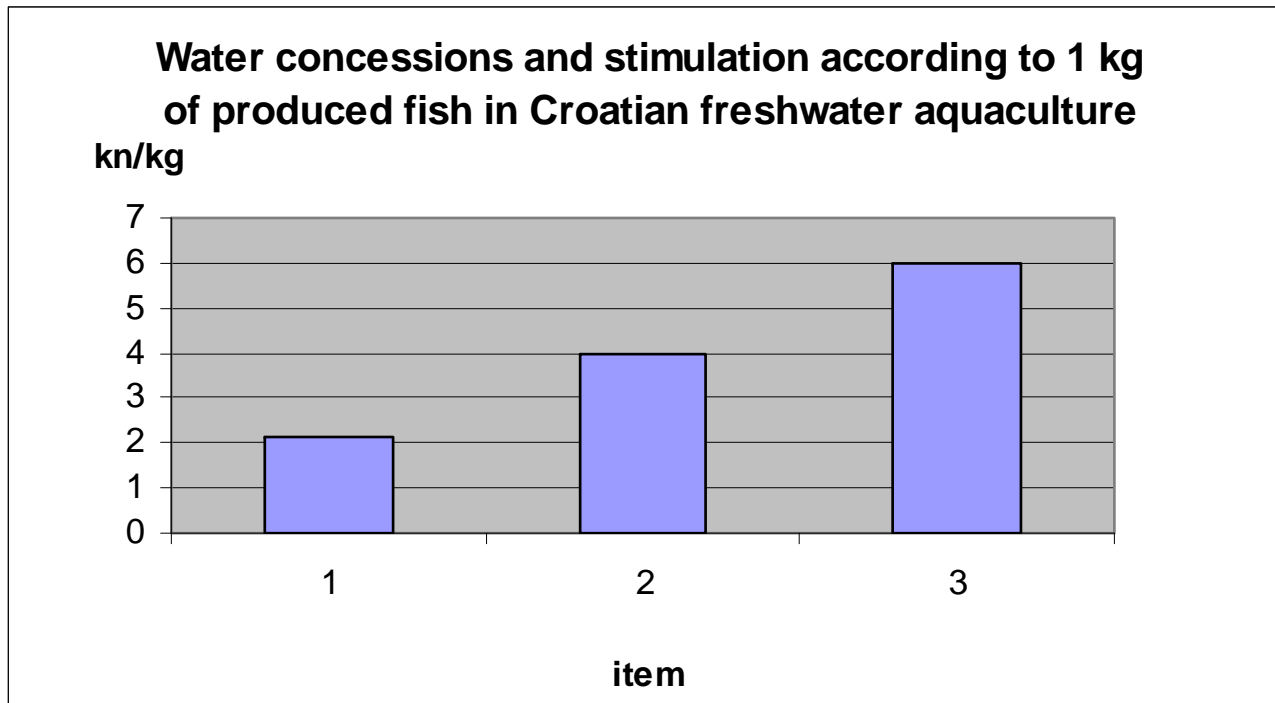




The location of investigated farms in Croatia (numbers indicate the family names of the owners):

- 1- Posavec
- 2- Petko
- 3- Vranešić
- 4- Šaravanja
- 5- Krajačević
- 6- Grđan
- 7- Drempetić
- 8- Deško
- 9- Delišimunović
- 10- Vrabac
- 11- Kundić
- 12- Borić
- 13- Čikota



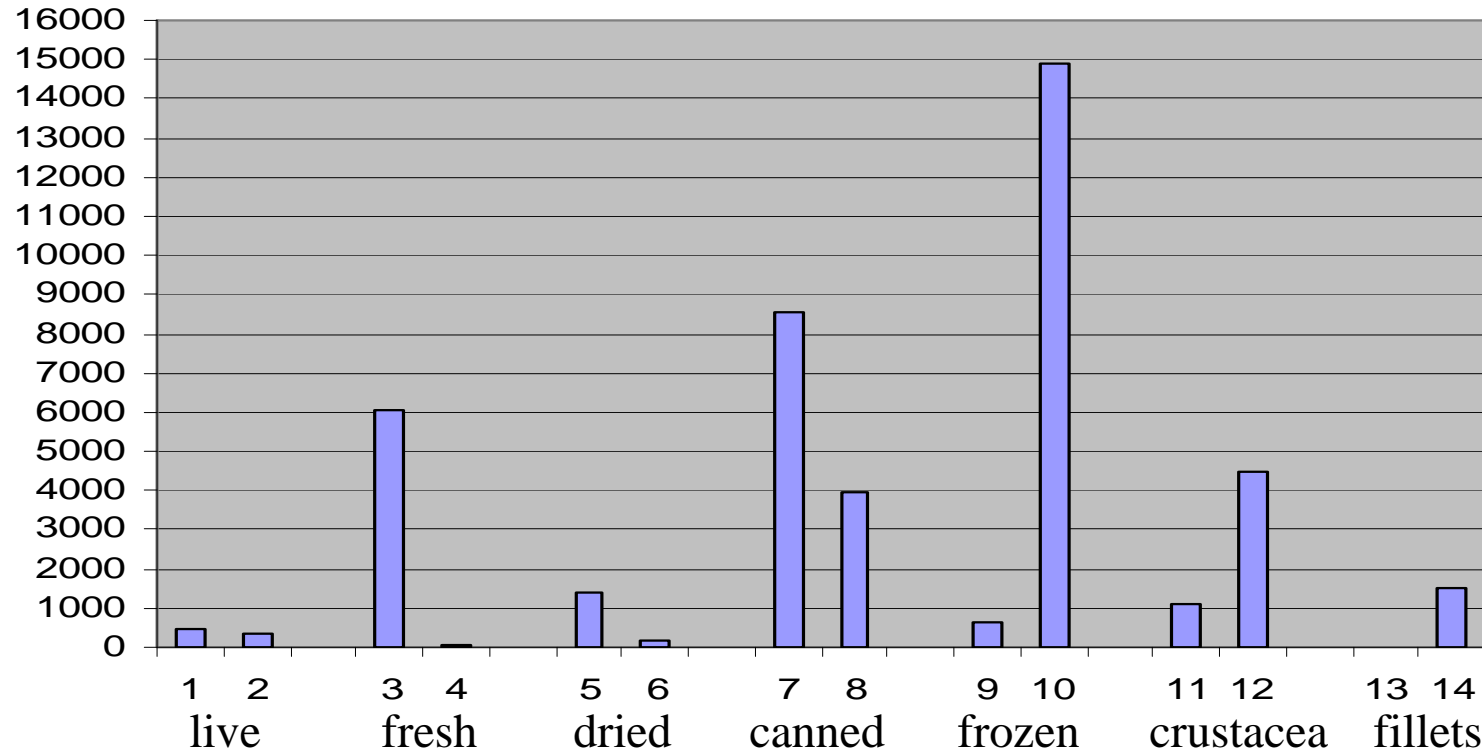


**1 = concessions according to the fish-farm area + water volume + 1% of fish value + 0,76% of salaries**

**2 = stimulation for common carp, grasscarp, silver carp and bighead**

**3 = stimulation for European catfish, pike-perch, pike, tench and trout**

## Croatian export and import of fish and fish products in 2000



**1 = export of live fish**

**2 = import of live fish**

**3 = export of fresh or refrigerated fish**

**4 = import of fresh or refrigerated fish**

**5 = export of dried, salted and smoked fish**

**6 = import of dried, salted and smoked fish**

**7 = export of canned fish**

**8 = import of canned fish**

**9 = export of frozen fish**

**10 = import of frozen fish**

**11 = export of crustaceans and mollusks**

**12 = import of crustaceans and mollusks**

**13 = export of fish fillets**

**14 = import of fish fillets**

# Goals of the **freshwater aquaculture strategy**:

✓ Use the **ecological** advantages of extensive culture, particularly on less productive parts of fish-farms



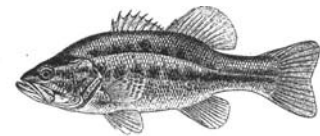
✓ Carp culture intensity (**2 or 3 years**) according to the market demands



✓ Stimulate the **alternative ways of use** of some parts of carp fish-farms (for recreational fisheries, culture of birds, restaurants and recreation etc.)



✓ Facilitate the **wider assortment** of cultured fish species



✓ Stimulate fish **selling whole year round**



- ✓ Control of **ichthyofagous bird** species



- ✓ Reduce and where possible **cut the concessions** for water use in aquaculture, with the aim of competitive managing

- ✓ Check the possibilities to **reduce** the obligatory **taxes** for veterinary and hygienic controls



- ✓ Develop **financial stimulants** and favorable credits for fish production

- ✓ Stimulate the development of **family fish-farms**



- ✓ Stimulate the investigation of **marketing** and promotion of freshwater fish and their products



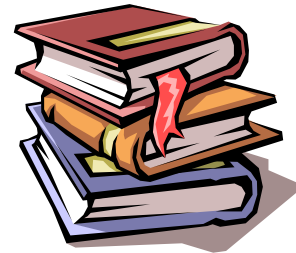
- ✓ Develop **international cooperation** in all segments of freshwater fisheries



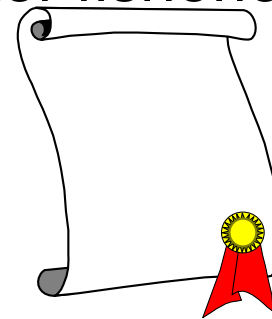
- ✓ Stimulate the employment of **high-educated** fish experts



- ✓ Upraise the **all-level education** in freshwater fisheries



- ✓ **Fishery laws** adjust to the freshwater fisheries strategy





# Recent Hungarian (Szarvas)- Croatian (Zagreb) projects

- „Comparison of genetic variability of Hungarian and Croatian common carp strains bred in fish farms and kept in live gene banks”
- „Genetic basis of repatriation of three Croatian carp lines, reserved in Hungarian ex-situ live genebank, to their farms of origin”
- Results:
  - - satisfied fish farmers
  - - common papers
  - - lectures
  - - diploma works
  - - PhD



