

Informal Meeting of the EU Directors General for Fisheries in Hungary, 6 th of June, 2011.

Aquaculture innovation in Hungary (Eastern European freshwater aquaculture)

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The presentation

1. Need for innovation in freshwater aquaculture
2. HAKI experiences with EU projects and European collaborations
3. Hungarian case studies of innovative projects in freshwater aquaculture

1. Need for innovation in freshwater aquaculture

Increasing role of aquaculture in food supply



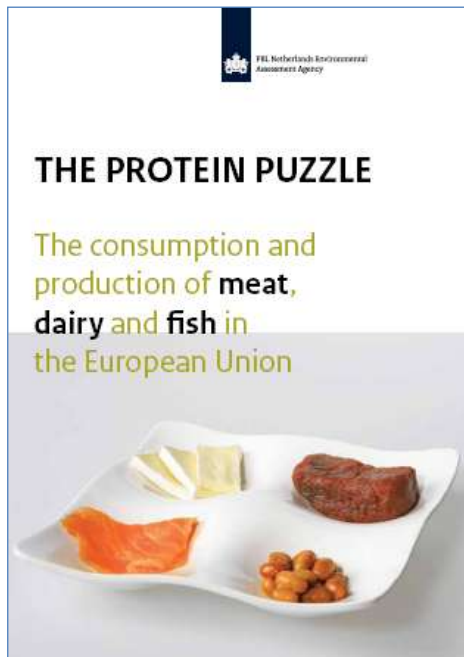
Radically Rethinking Agriculture for the 21st Century

N. V. Fedoroff, *et al.*

Science **327**, 833 (2010);

DOI: 10.1126/science.1186834

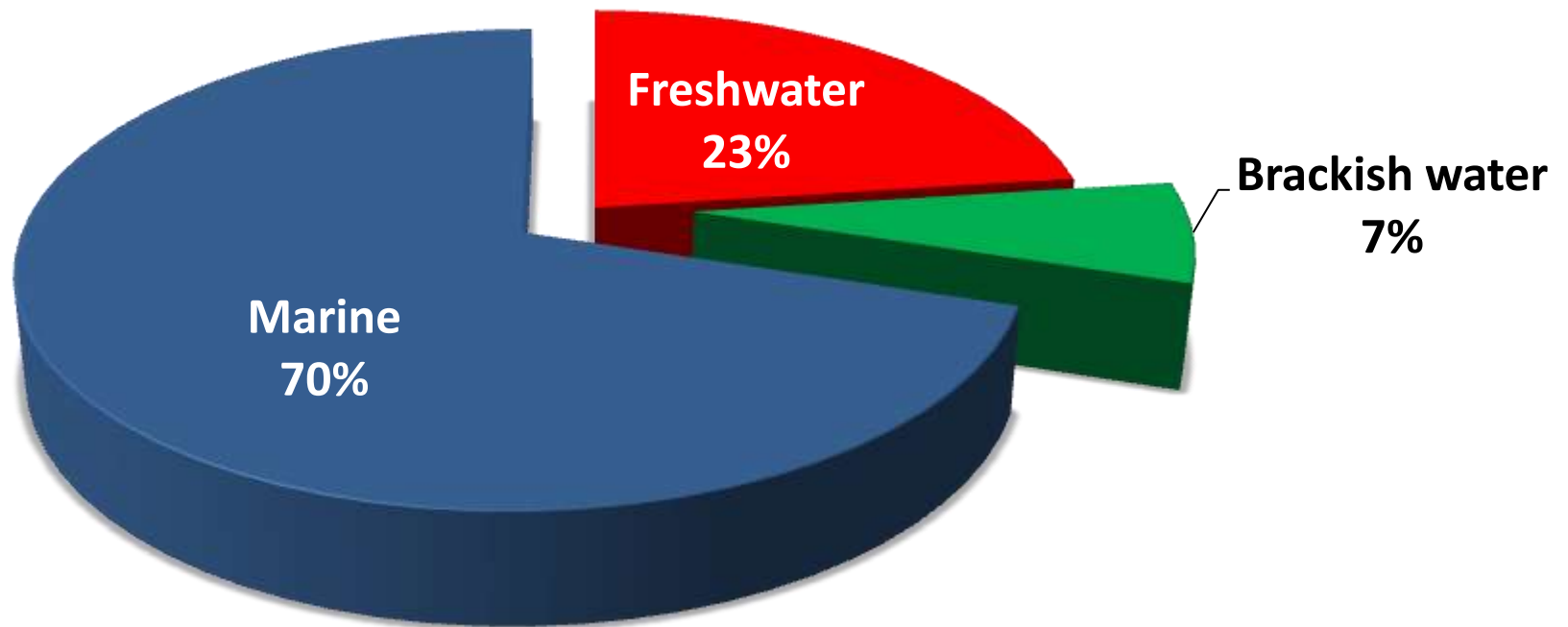
„Aquaculture is a part of the answer.”



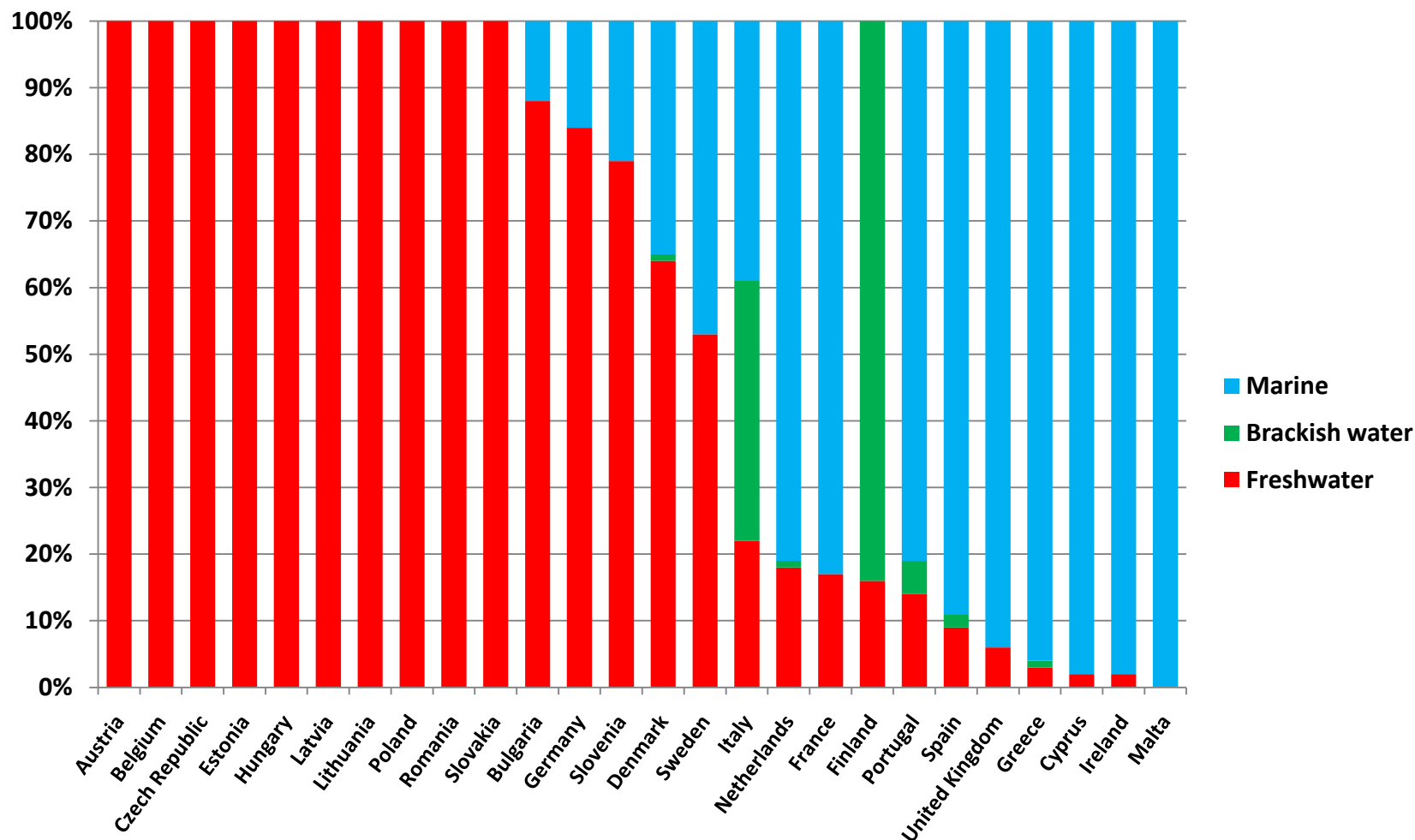
„Fish farming could be an option”

(„Increased consumption of herbivorous fish”)

EU 27 aquaculture production by environment, 2008



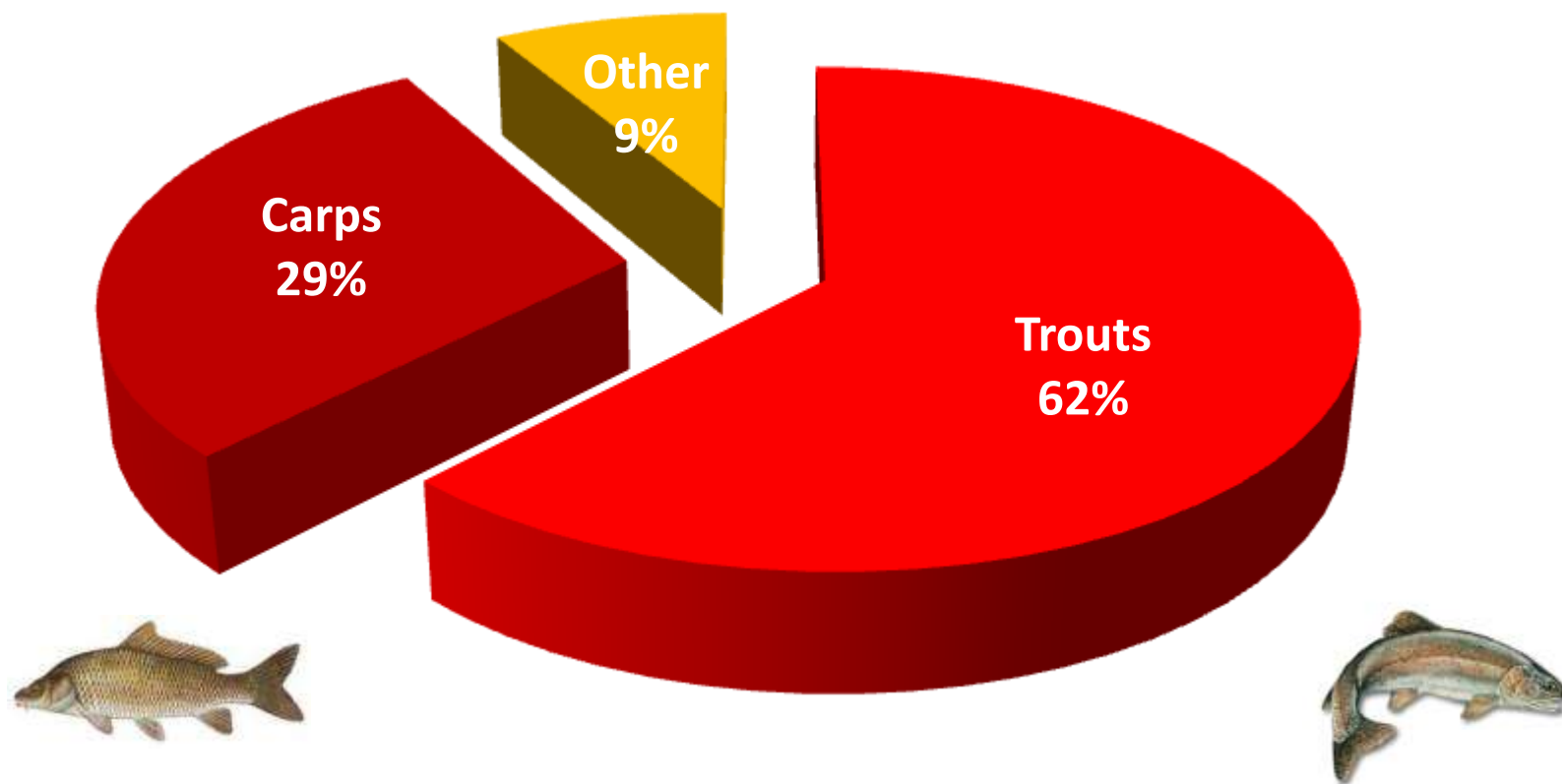
Share of aquaculture production of EU 27 countries by environment, 2008



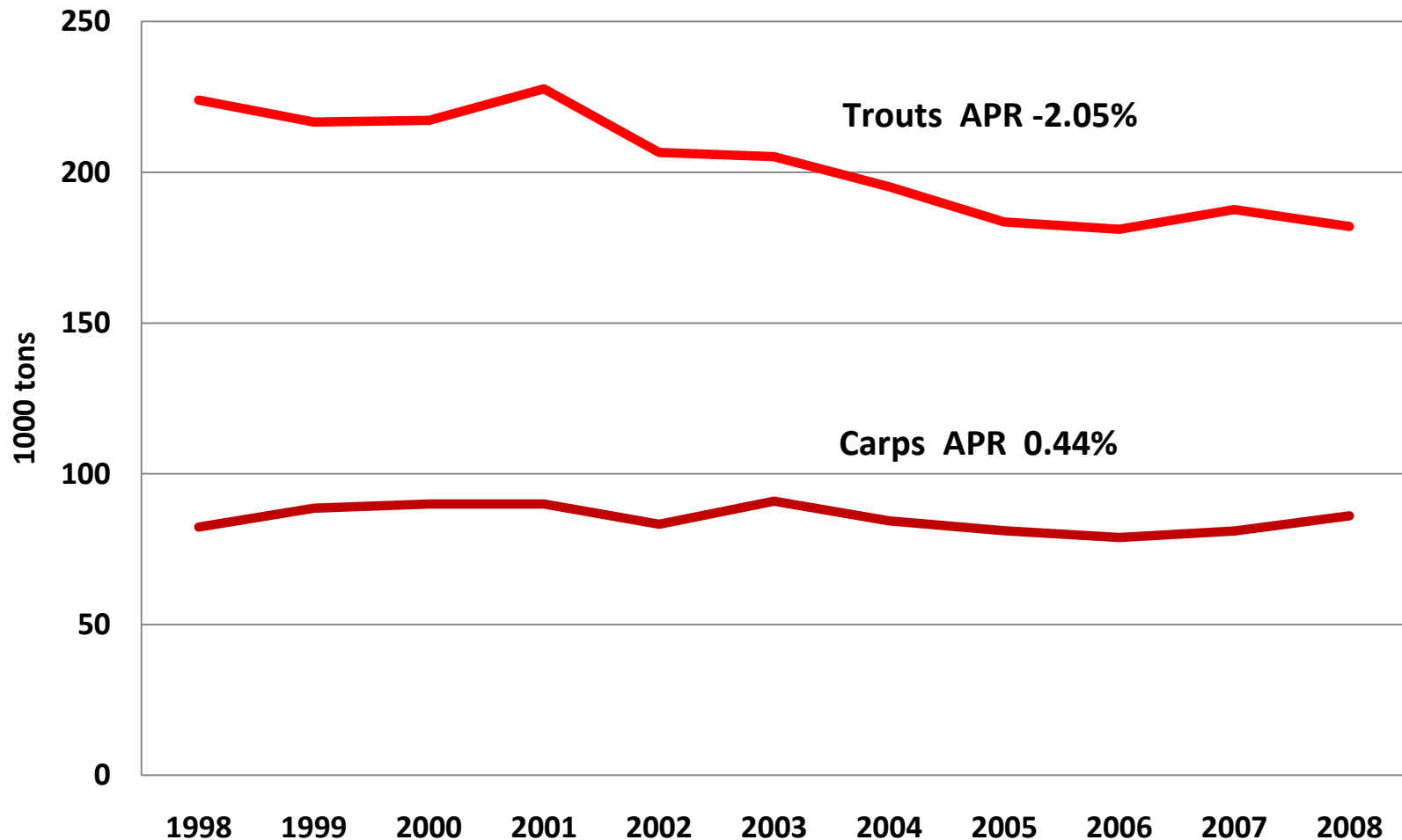
13 countries: more than 70% of aquaculture from freshwater

10 countries: 100% of production from freshwater

EU 27 freshwater aquaculture production by species groups, 2008



Freshwater aquaculture production and average percentage rate of growth (APR) by species groups, 1998-2008



Principal systems and species

Flow-through systems



Rainbow trout

**Innovation to turn
flow-through
systems into open air
RAS**

Fishpond systems



Common carp

**Innovation to
combine
traditional values
with modern
technologies**

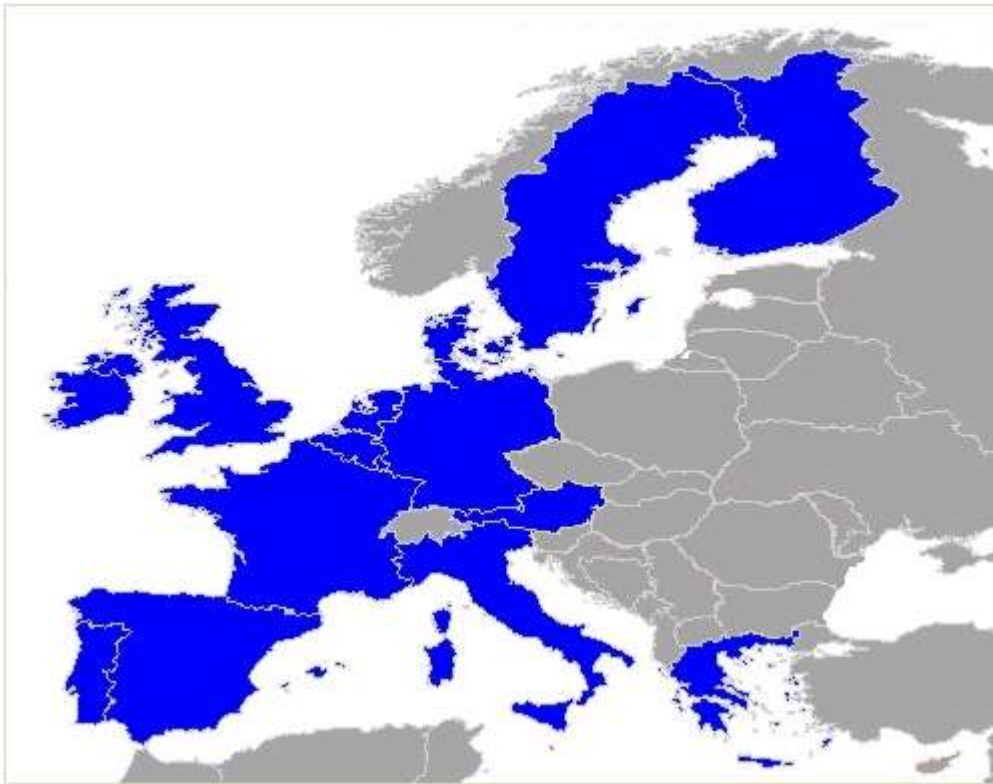
RAS



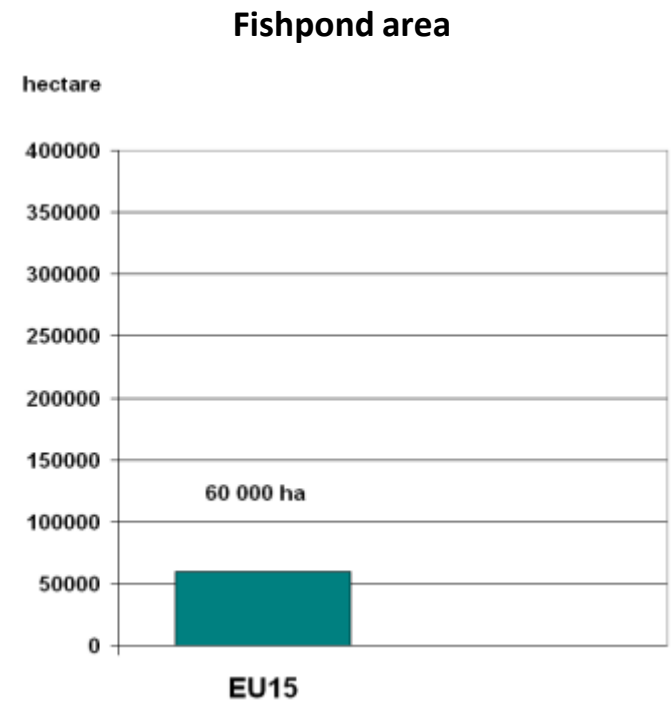
*High market value
species*

**Innovation to
improve economic
feasibility**

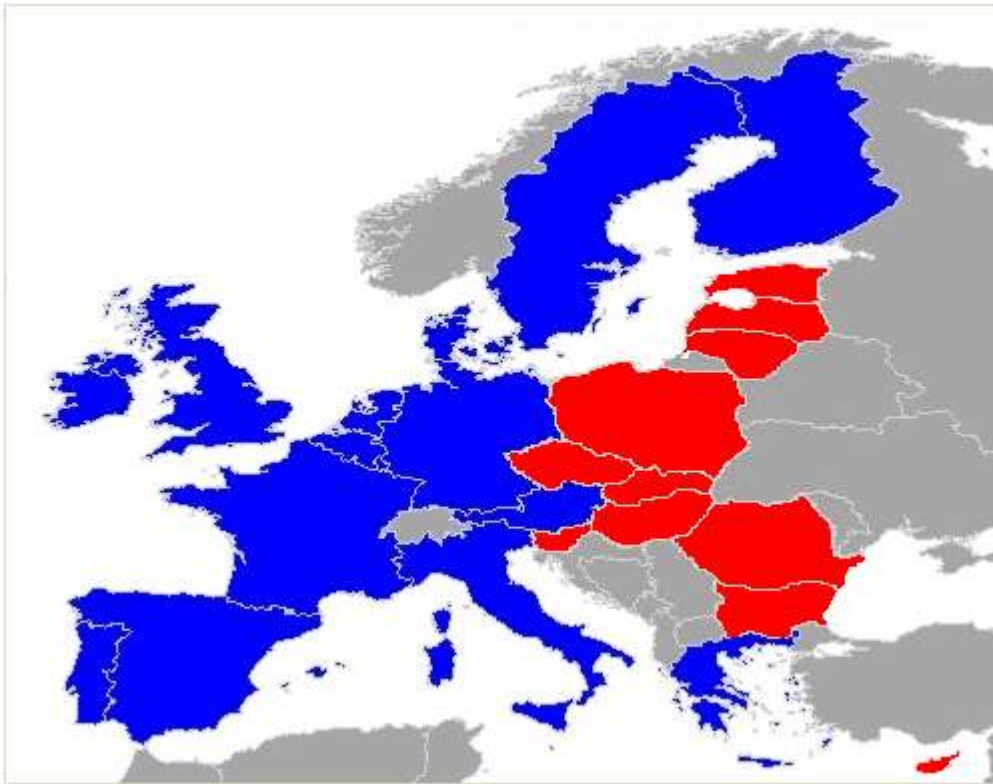
Enlargement of the European Union



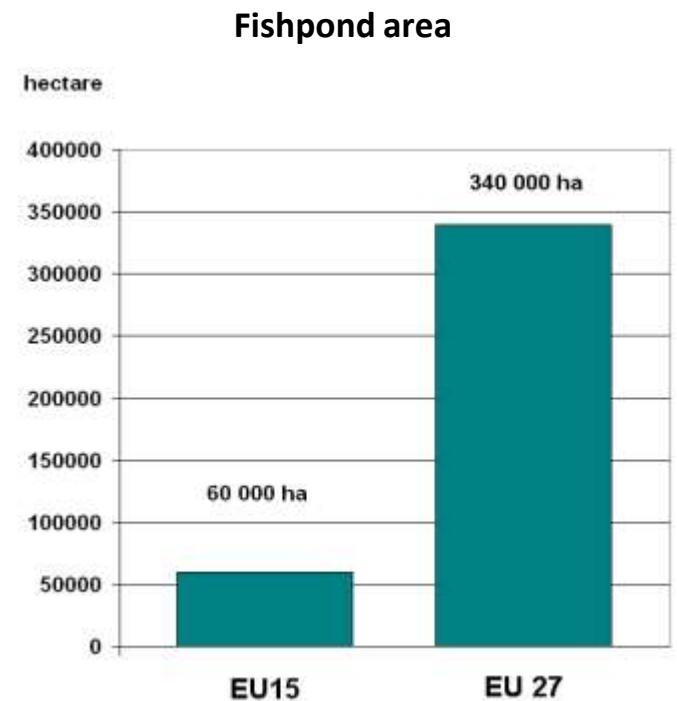
EU - 15



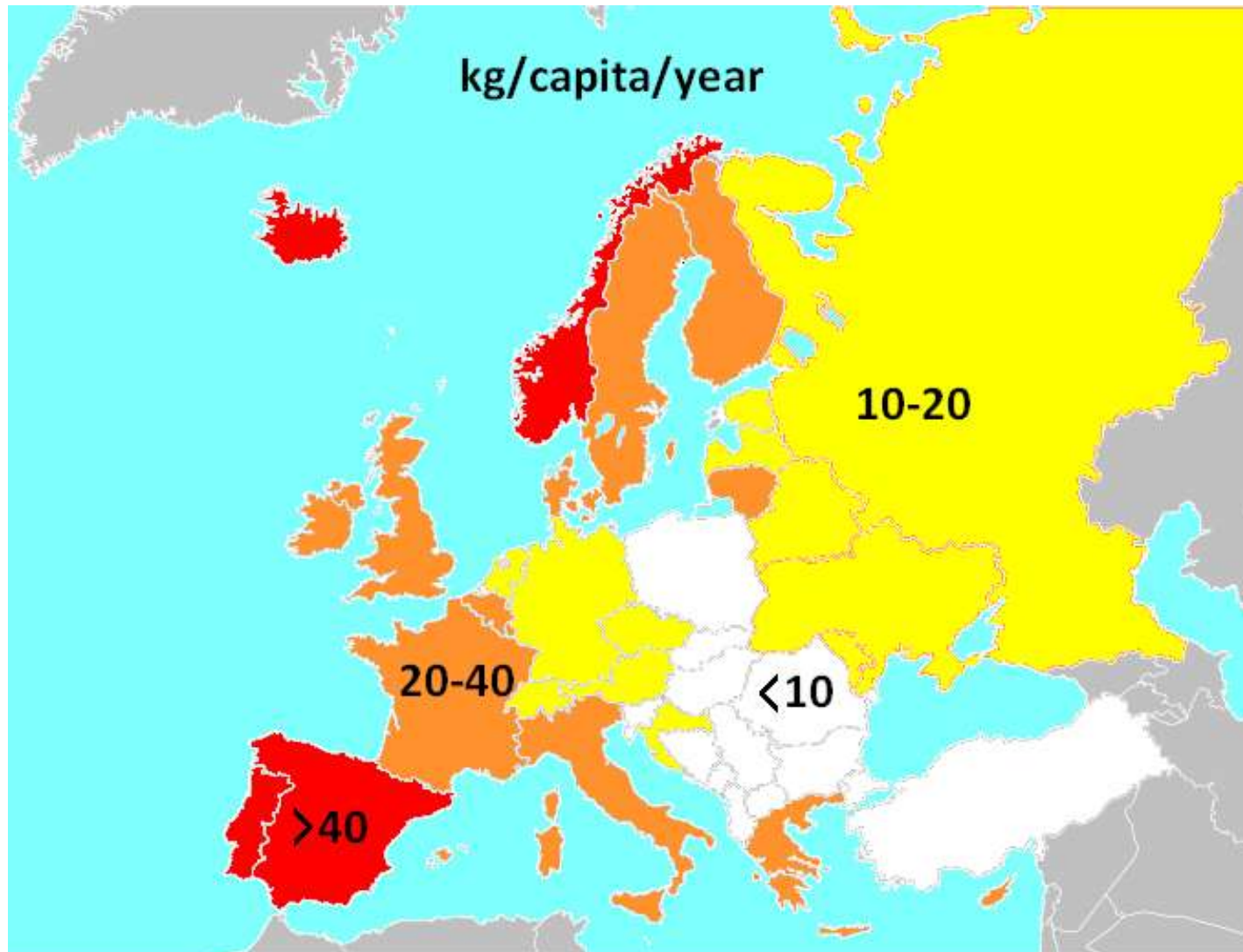
Enlargement of the European Union



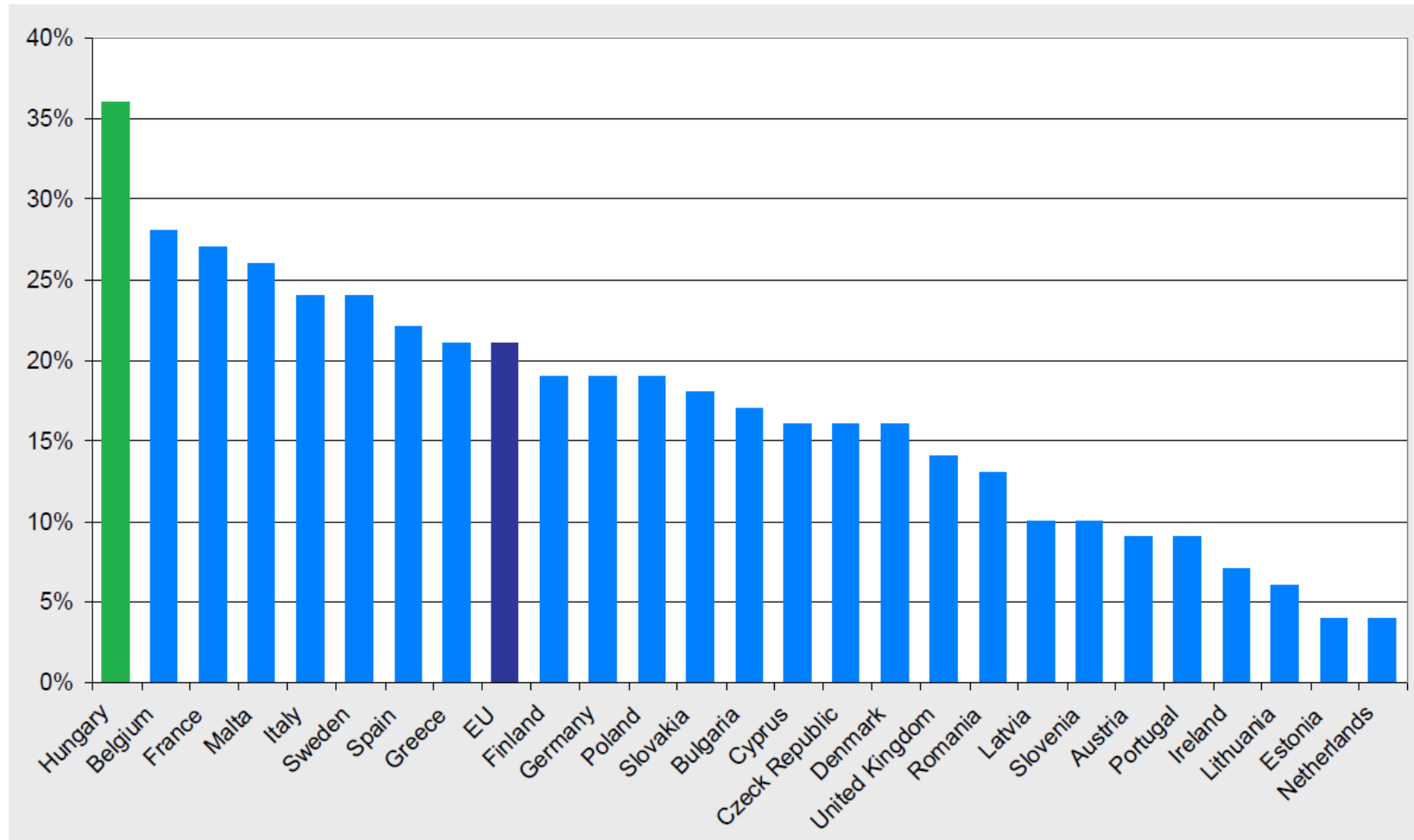
EU - 27



Fish consumption in Europe (2007)



Market share of aquaculture in EU countries



Aquaculture is important employment provider in „fish pond” regions

Labour productivity

- Ponds:
1000 t/100-120 employee
- Intensive (automated) systems:
1000 t/ 3-4 employee



Specificities of extensive pond aquaculture



**Production of aquatic animals in low input systems
(„extractive” aquaculture)**

Employment in rural areas

Environmental and ecological services

Main threats to pond fish farming



Losses caused by protected animals



Extreme weather conditions



Water pollution

Some findings

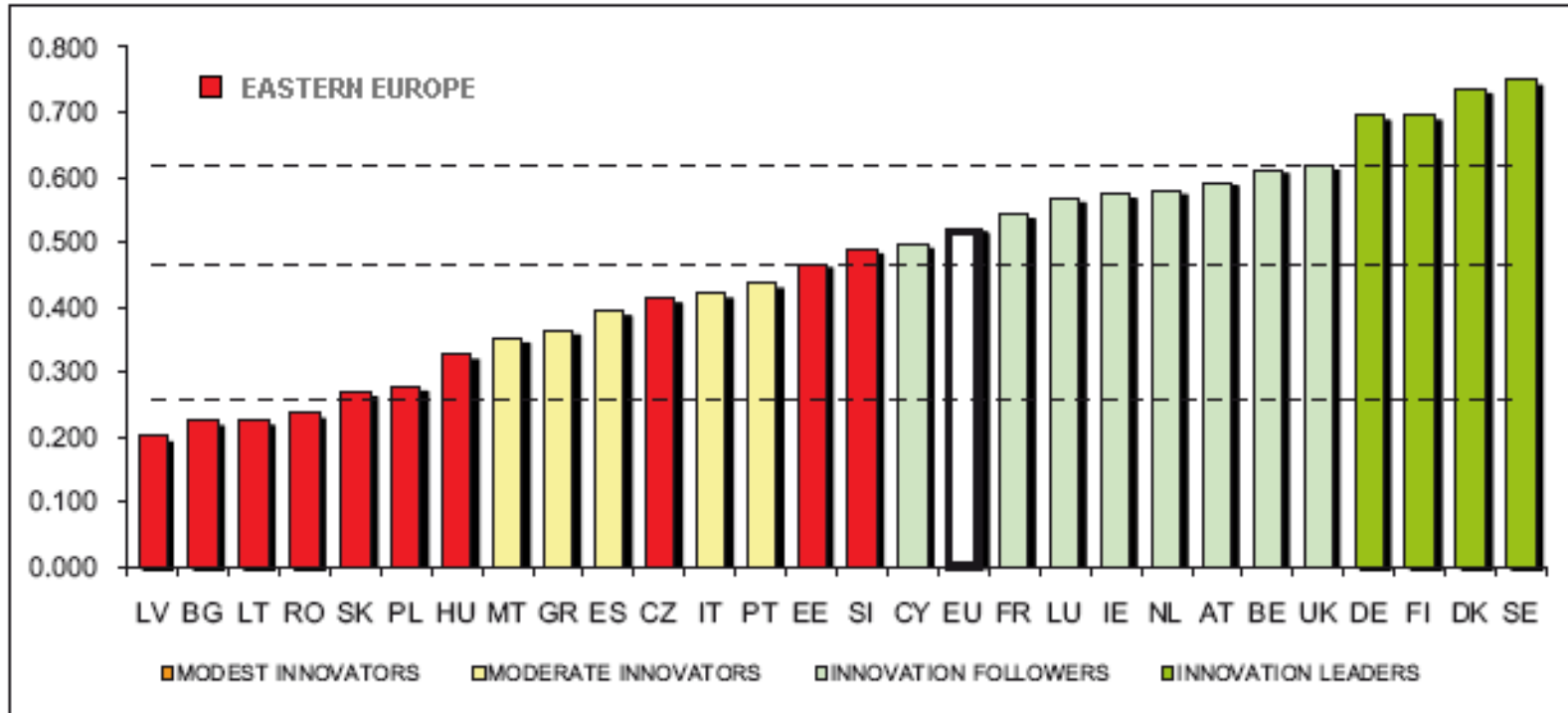
Freshwater pond aquaculture is an unexplored opportunity in the development of food security and rural livelihood in many regions in the EU especially in NMS in CEE

Specificities of pond aquaculture should be better understood and acknowledged by the public and policy makers.

There is need for appropriate regulation, support for ecological and environmental services and compensation for the losses caused by protected species

There is a need for innovation

Innovation performance of EU countries, 2010



EU is failing to close the innovation performance gap with its main international competitors, the USA and Japan

However there is innovation performance gap even within the EU

Central and Eastern Europe lag in innovation

- legacy of the „centrally planned” economy
- inefficient public-private partnership
- gap in technology transfer
- bureaucratic constraints
- limited national support for R&D and innovation
- limited national resources (fund, human)
- lack of innovation by SMEs



Aquaculture innovation in CEE

- Poor understanding of innovation
- Poor participation in stakeholder consultation
- EFF FOP provides opportunities BUT
- Poor participation in EATIP activities
- Limited support mechanism for CEE countries



3. HAKI experiences with EU projects and European collaboration

HAKI, Research Institute for Fisheries, Aquaculture and Irrigation

HAKI is a flagship institution in freshwater aquaculture R&D in Hungary and in the Central and Eastern European region



The center of HAKI at Szarvas (Eastern Hungary)



Main elements of R & D strategy of HAKI

- **Multidisciplinary research in active international collaboration**
- **Facilitate knowledge and technology transfer between science and practice**
- **Participation in international development assistance programmes in developing countries**





Active European collaboration



HAKI is partner of FAO FID/FIRA; SEUR and EIFAC



HAKI is actively involved in EU funded projects and bilateral collaborations with institutions in EU member countries



Director of HAKI was president EAS (European Aquaculture Society) between 2004-2006



HAKI is an institutional member of EATIP since 2009, involved in the activities of TAs



HAKI is a founder and coordinator of NACEE, Network of Aquaculture Centers in Central and Eastern Europe

Network of Aquaculture Centres in Central and Eastern Europe



HAKI is coordinator of NACEE having 45 members from 15 CEE countries; NACEE is a registered NGO in Hungary; Headquarters is in Szarvas, Hungary

NACEE is an unexplored opportunity to facilitate innovation



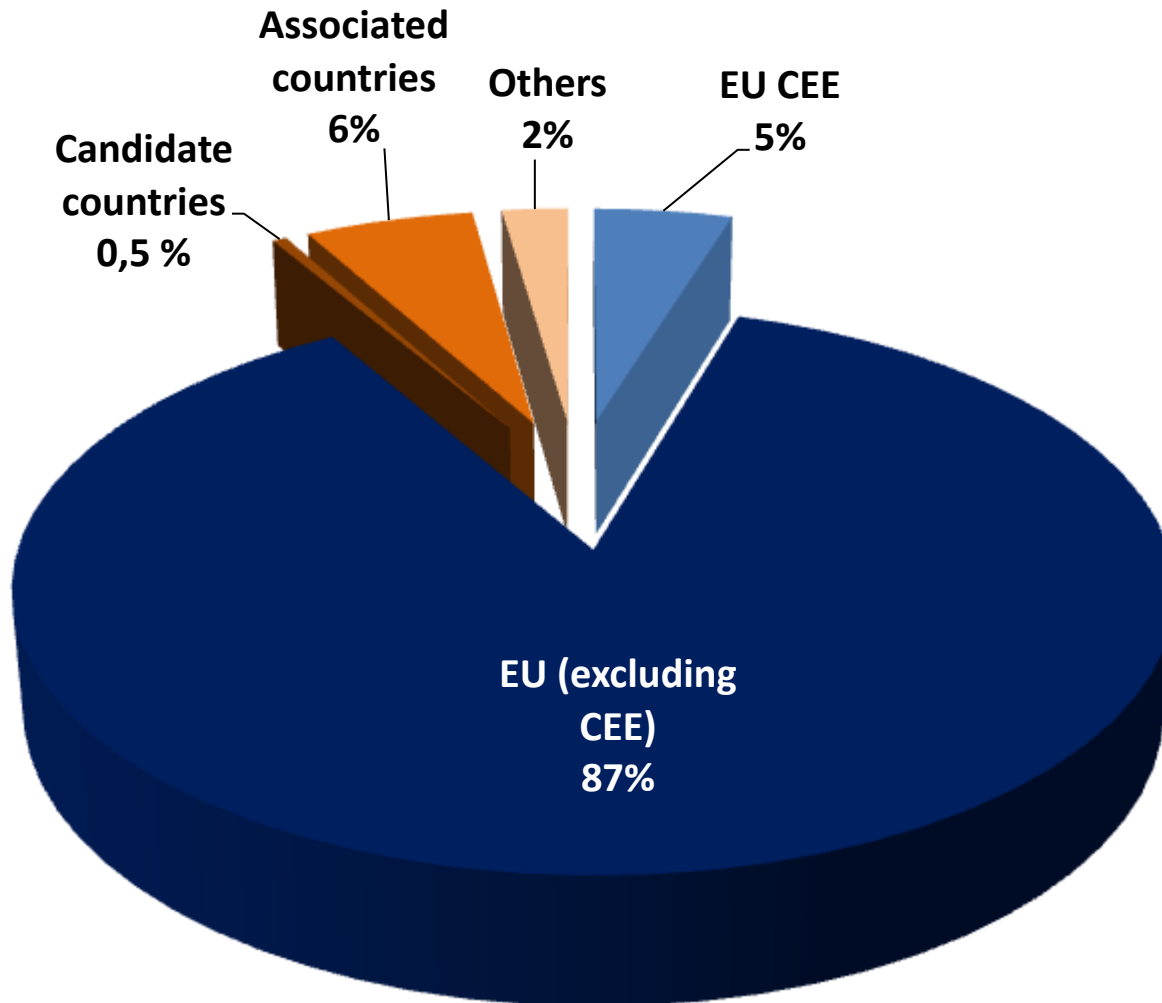
Main EU funded projects in HAKI

CONSENSUS; IMPASSE, SUSTAINAQ; SUSTAINAQUA; ROSA
EXINLAND

EUROCARP:	174,000 Euro (2006-2008/2011)
AQUAMAX:	375,000 Euro (2006-2009/2011)
ROSA:	180,000 Euro (2009-2010/2011)
AQUASEM:	51,000 Euro (2009-2013)
PESCALEX:	32,000 Euro (2009-2012)
CLEANHATCH:	245,000 Euro (2010-2012)
AQUAEXCEL:	250,000 Euro (2011-2015)

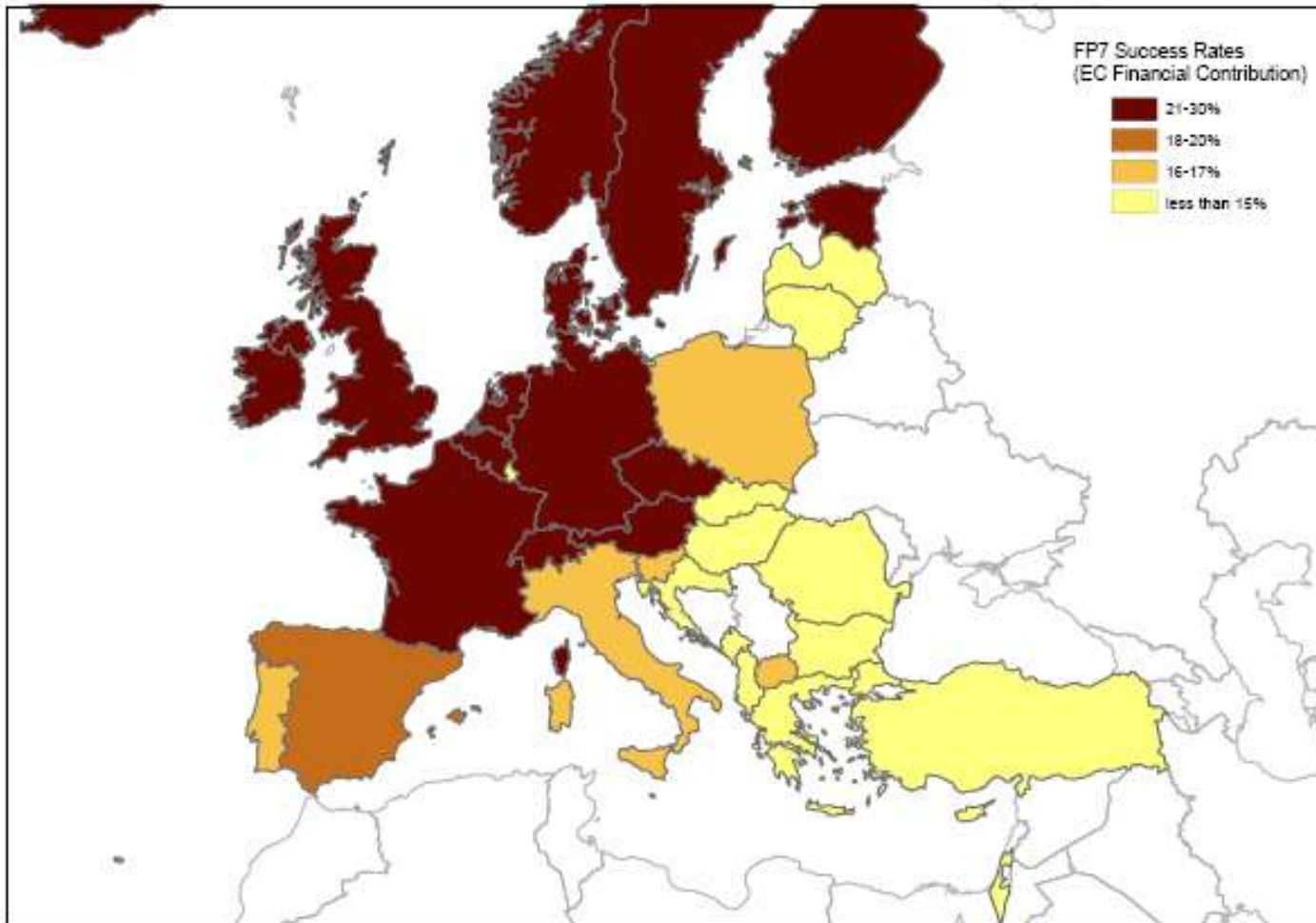
Participation in FP6 by regions

In terms of EC financial contribution



Country performance in FP7 (1st year)

Success rate in terms of EU contribution



Some findings

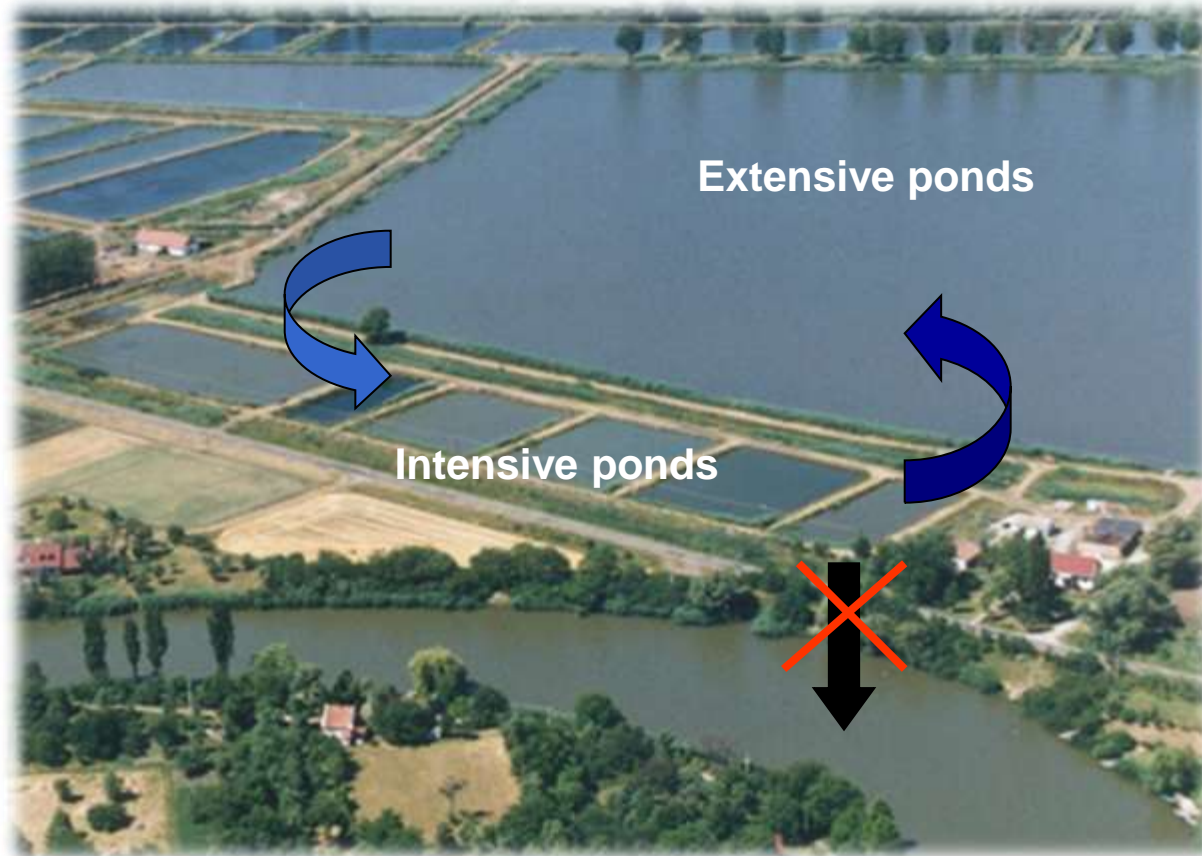
Poor (unproportional) participation of CEE institutions in FP 6 and FP 7 projects

More national and EU support is needed to develop and mobilize R&D resources in CEE for innovation

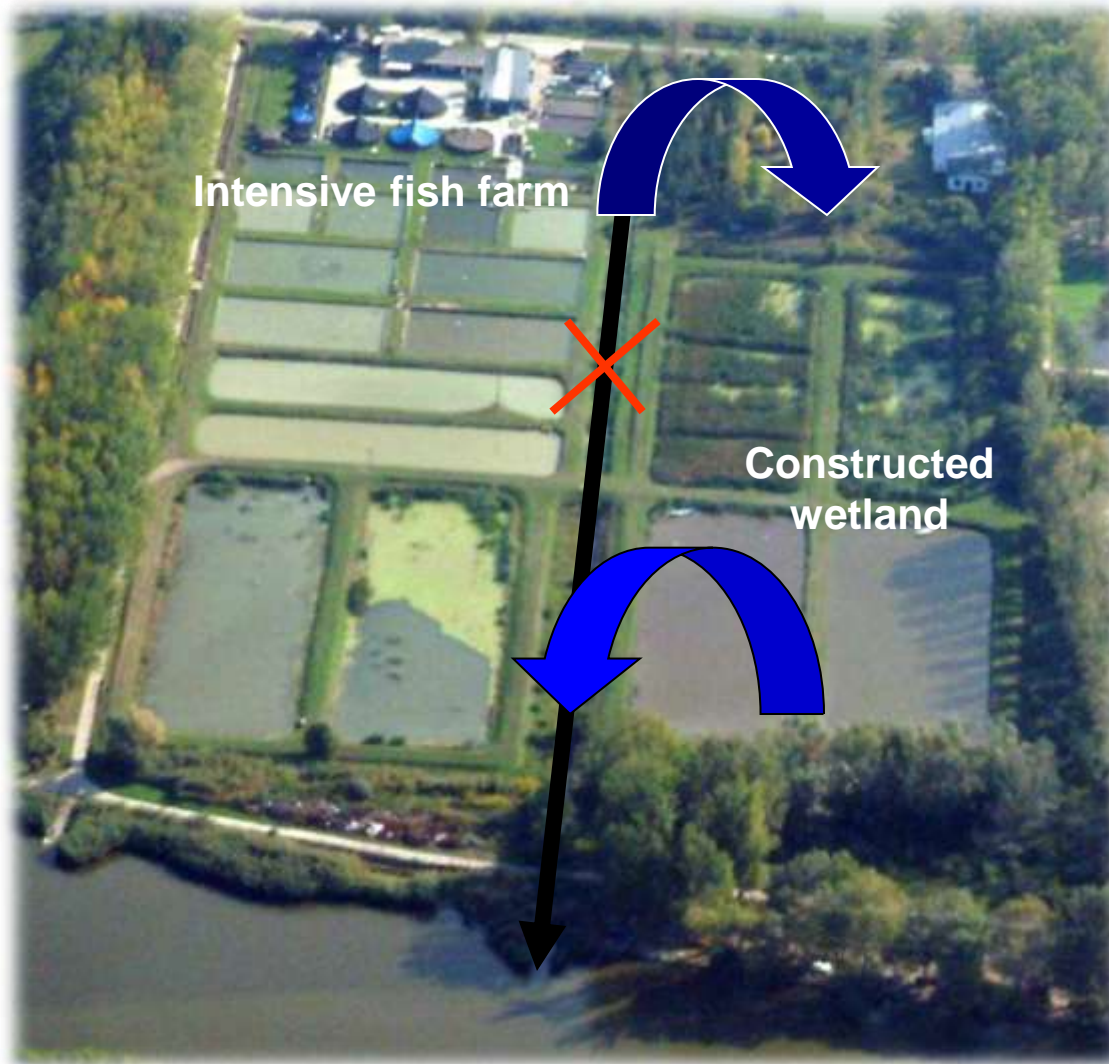
NACEE is an unexplored opportunity (to facilitate innovation and inter-regional collaboration)

3. Hungarian case studies of innovative projects in freshwater aquaculture

Combined intensive-extensive system



Effluent treatment in constructed wetland



Multi-functional pond fish farming



1- Önkiszolgáló fogadóközpont



Higher and diversified farm income



Production of high value species using natural food



Paddle fish *Polyodon spathula*

Production of high value species in RAS



Barramundi and Red drum

Using geothermal water resources for intensive aquaculture



African catfish *Clarias gariepinus*

„Pond in pond” system



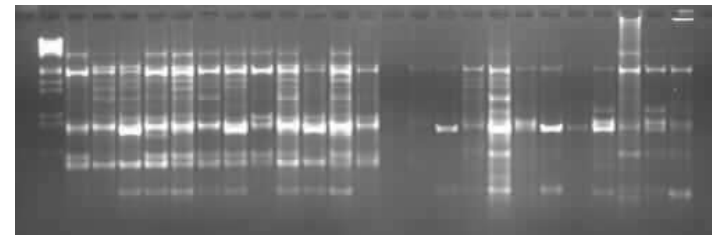
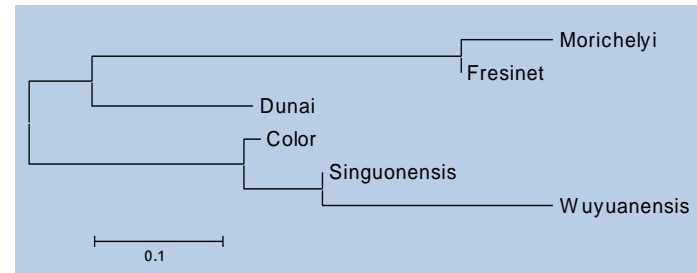
Gene banking and breeding of common carp



**Live gene bank
of common carp varieties**

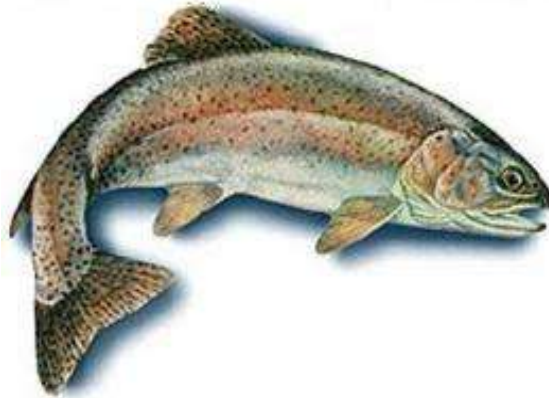
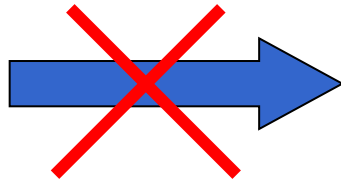


Genetic characterisation of common carp



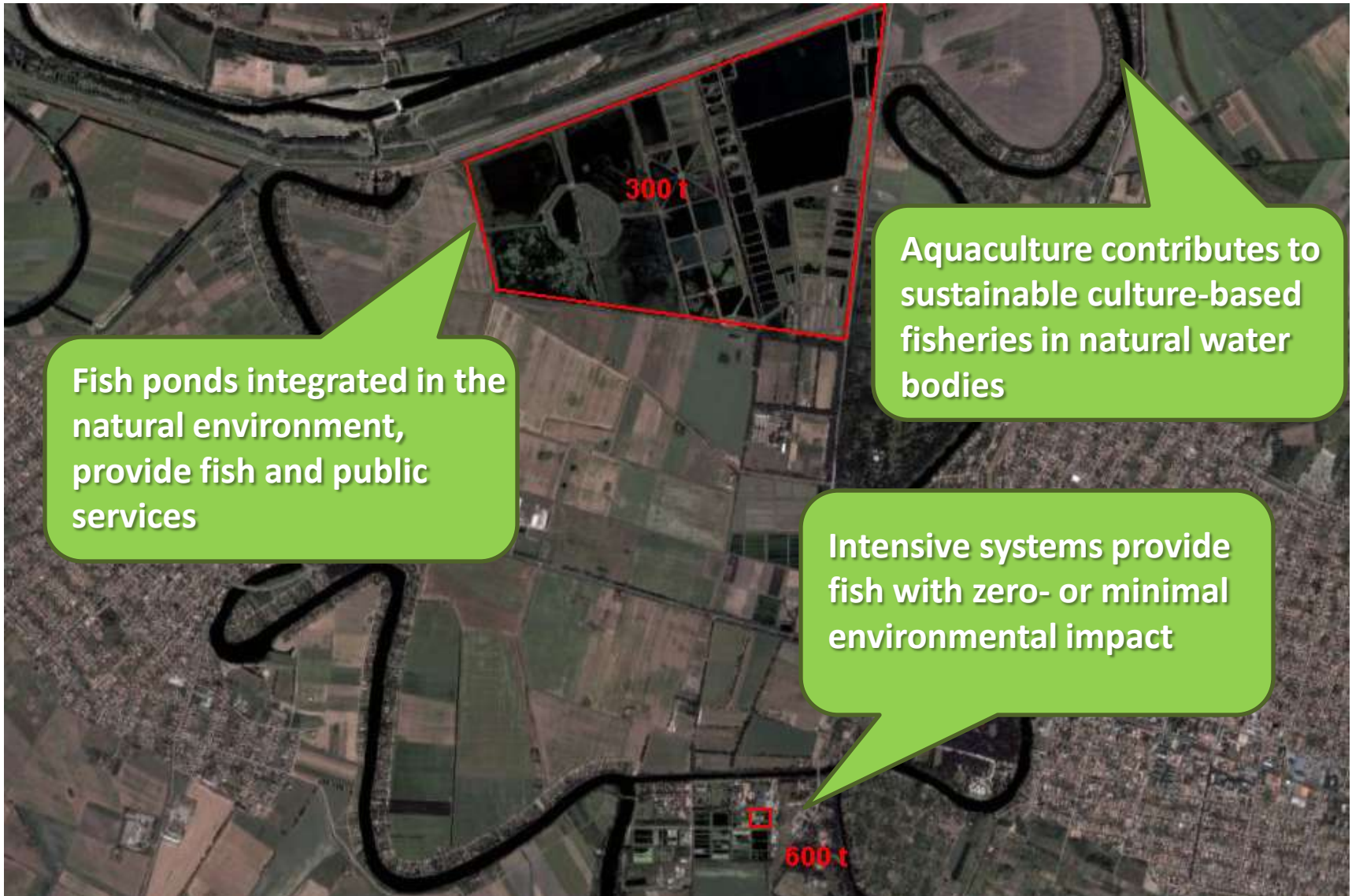
Better growth and disease resistance

The use of Chinese herbs as immunostimulants for cultured fish species



Healthy fish - healthy environment- healthy consumers

Freshwater aquaculture in 2020



Fish ponds integrated in the natural environment, provide fish and public services

Aquaculture contributes to sustainable culture-based fisheries in natural water bodies

Intensive systems provide fish with zero- or minimal environmental impact



Thank you for
your attention!