

Recent trends in aquaculture innovation in the European Union: The role of HAKI

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The presentation

1. Facts and figures of EU aquaculture
2. Main challenges for the EU aquaculture sector
3. Response to challenges is innovation
4. HAKI in general
5. Examples of R & D projects for innovation

1. Facts and figures of EU aquaculture

Why aquaculture?



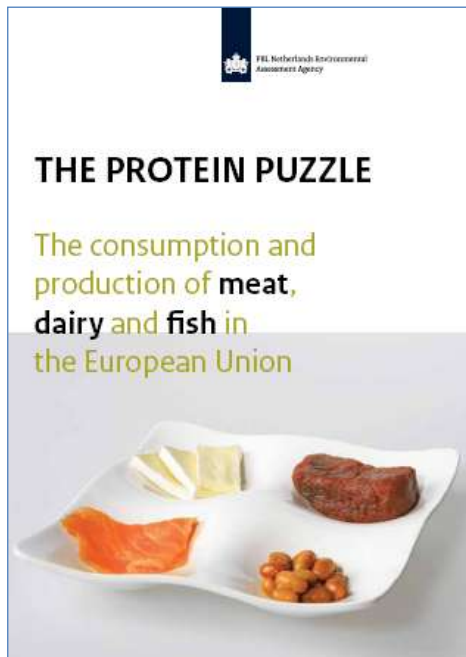
Radically Rethinking Agriculture for the 21st Century

N. V. Fedoroff, *et al.*

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

DOI: 10.1126/science.1186834

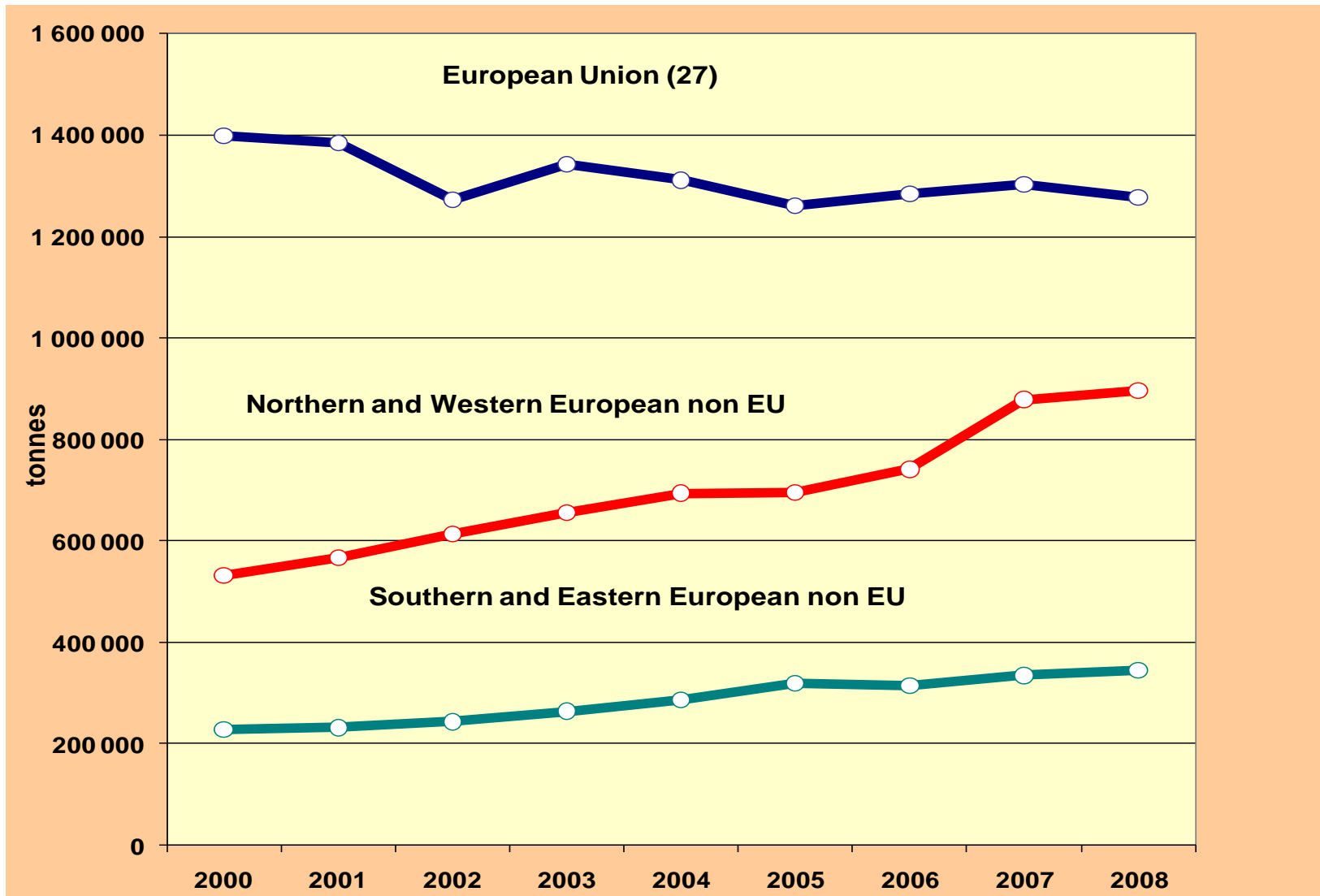
„Aquaculture is a part of the answer.”



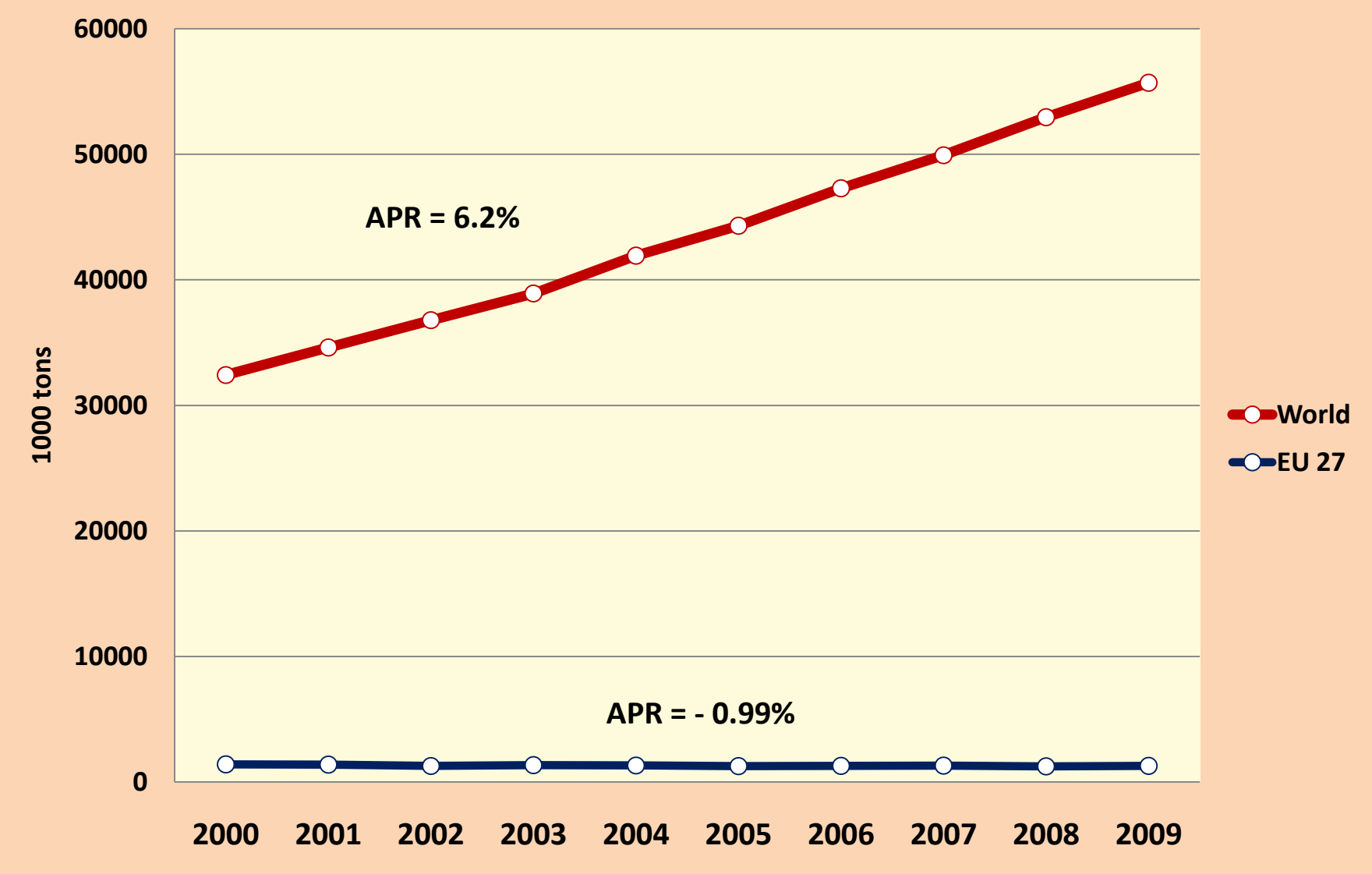
„Fish farming could be an option”

(„Increased consumption of herbivorous fish”)

Aquaculture production by European regions (volume)

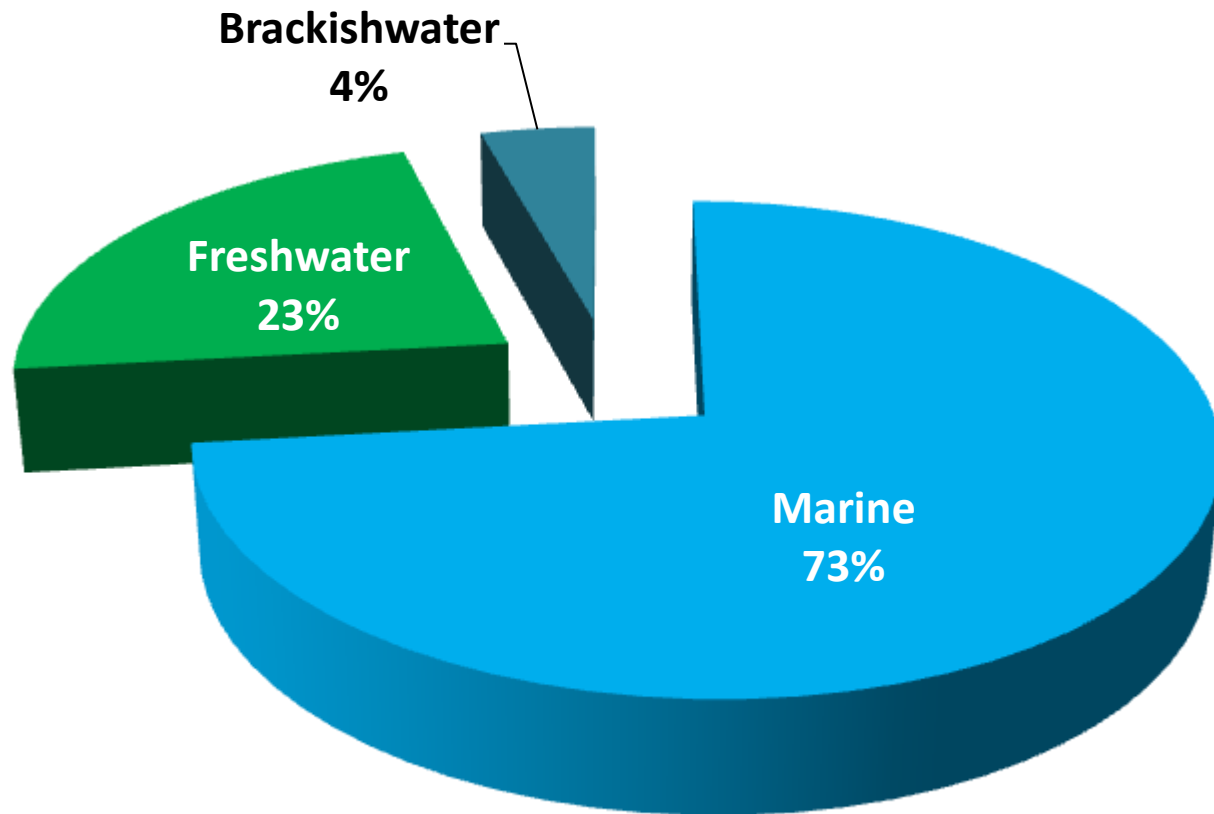


Aquaculture production (excluding aquatic plants)



Source: FAO FishstatPlus

Aquaculture production by environment in EU 27 countries (2009)



Principal farming systems

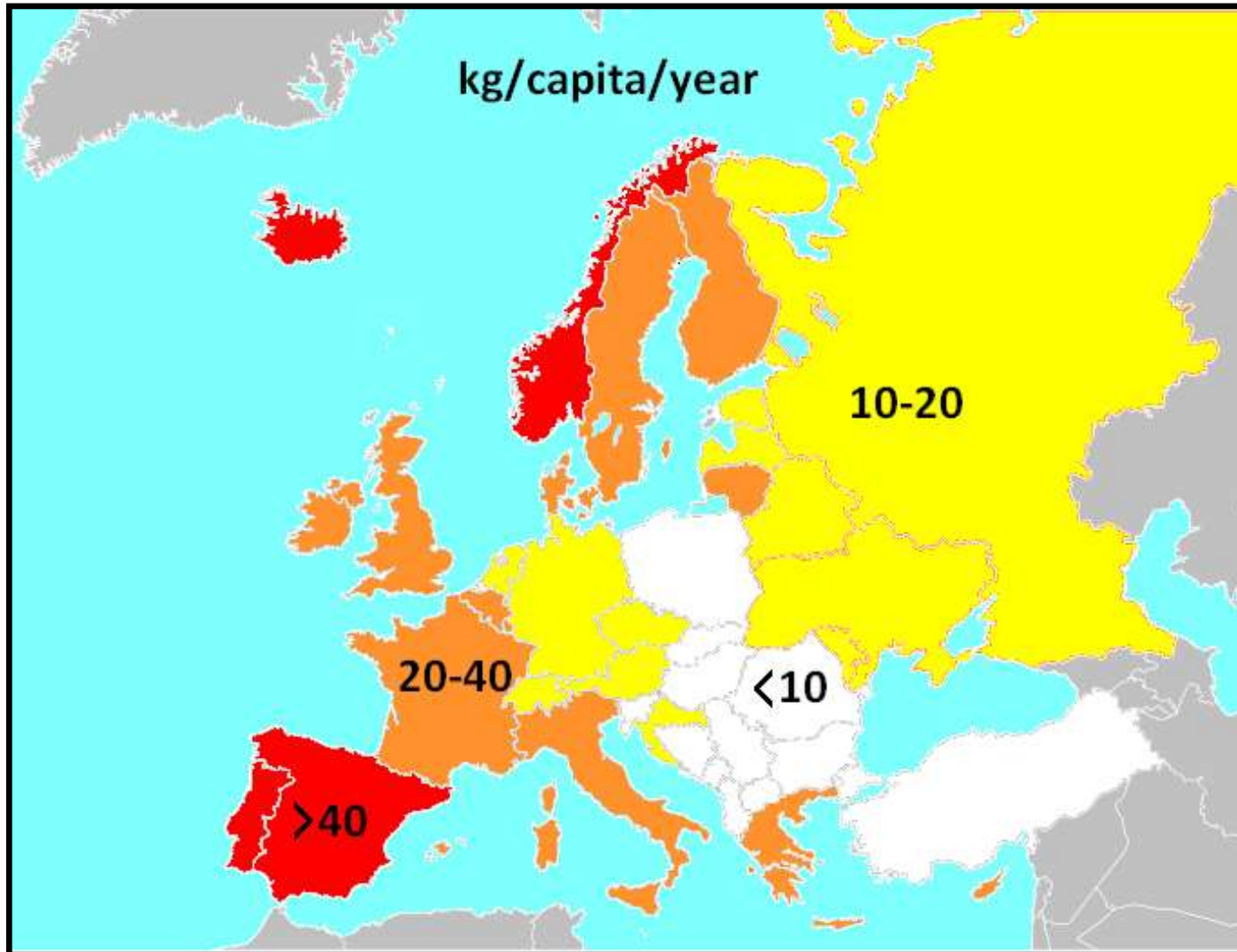


Fish supply-demand balance in the EU (2008)

Catches:	5.20 Mt
Aquaculture:	1.23 Mt
Non-food uses:	- 1.70 Mt
Export:	- 2.07 Mt
<hr/>	
Total supply:	2.66 Mt
Total consumption:	12.52 Mt
<hr/>	
Import:	9.86 Mt

74% of the total EU fish consumption is imported!

Fish consumption in Europe



3. Main challenges for the EU aquaculture sector

Main challenges for the EU aquaculture sector

The challenge for European aquaculture is to achieve innovative and ECONOMIC GROWTH.

The industry says:

- We have to be competitive
- We have to be profitable
- We need a „level playing field”



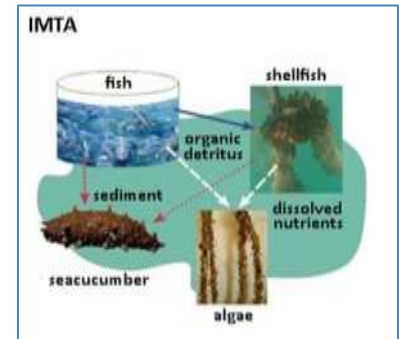
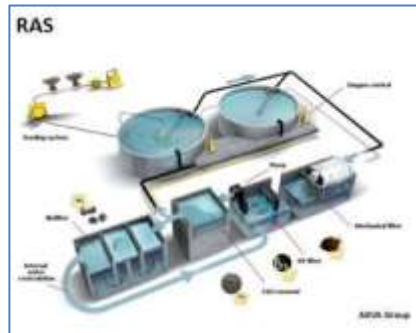
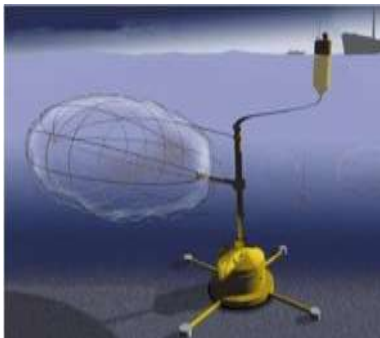
Some specific challenges for the EU aquaculture sector

- **Stringent regulations** (environment, animal health etc.)
- **Limited access to space and licensing**
- **Limited access to seed capital and loans**
- **Insufficiency of medicines and vaccines**
- **Industry fragmentation**
- **Pressure from imports**
- **Climate change** (weather extremities)
- **Variation in inputs** (fish meal/oil, seed, energy, labour)
- **Economic crises** (consumer preferences, purchasing power)

3. Response to challenges is innovation

Innovative sector

- **EATIP** (Vision, R&D strategy, implementation plan)
- **FEAP**
- **R&D institutions**
- **Innovative enterprises**
- **European organisations and networks**
(EUROFISH, AquaTnet, EFARO, NACEE etc.)



Enabling environment

- **Europe 2020** (smart, sustainable and inclusive development)
- **Reform of the CFP**
- **New EFF**
- **EU Aquaculture Strategy** („New impetus“)
- **FP-7 KBBE**
- **Political will**



Vision

European aquaculture is an environmentally, economically and socially sustainable activity, based on scientific evidences and consumer confidence



4. HAKI in general

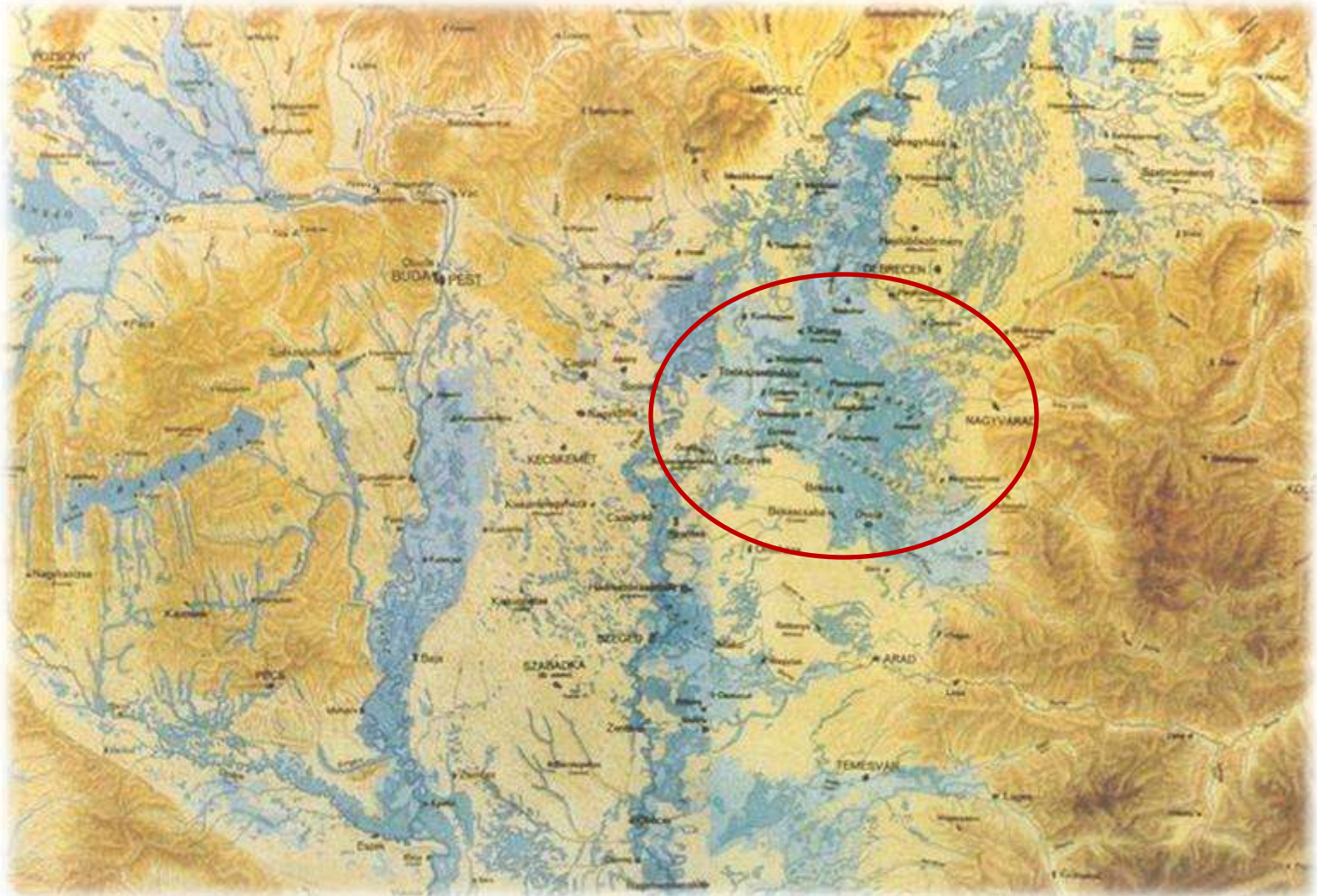
Research Institute for Fisheries, Aquaculture and Irrigation

HAKI

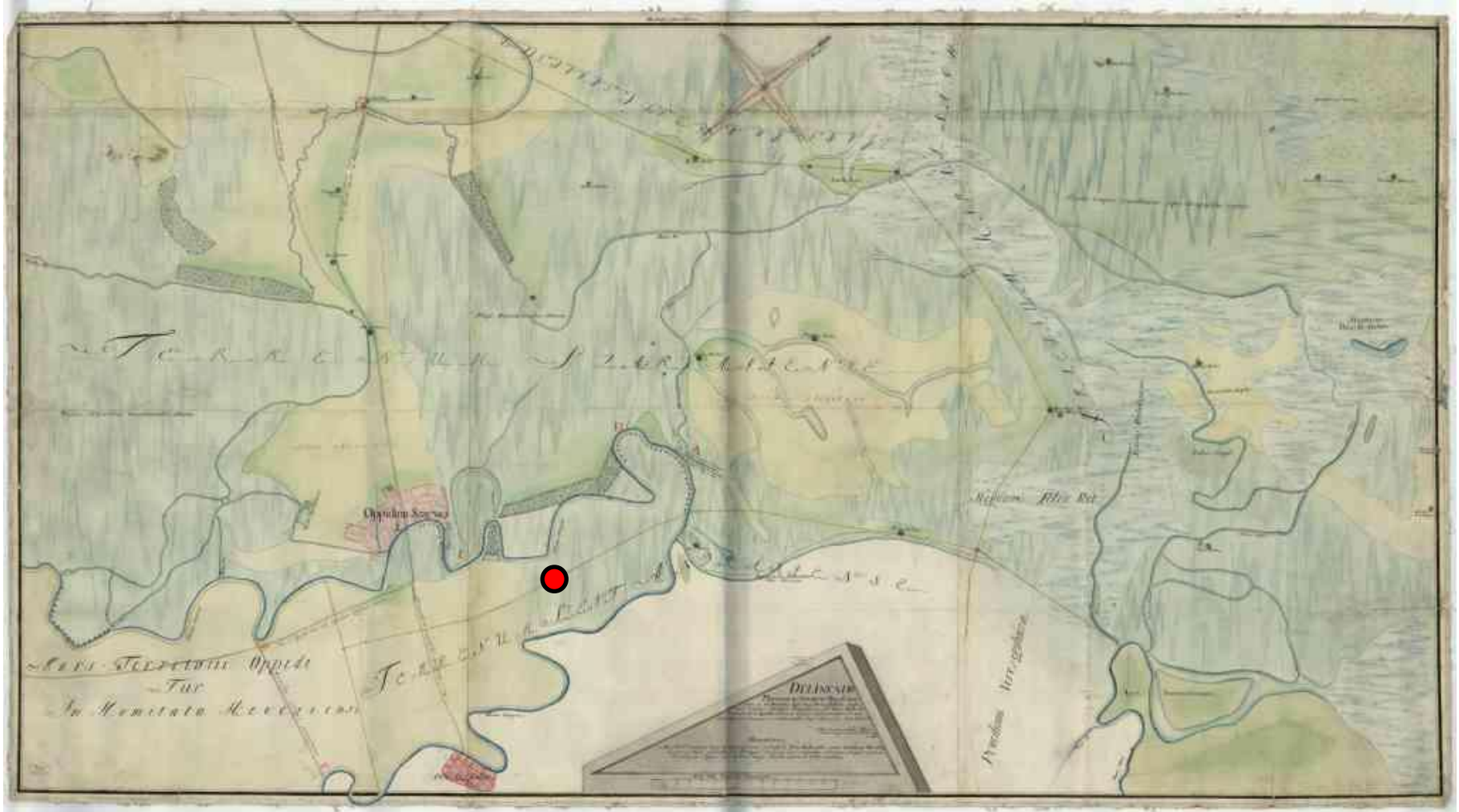
Szarvas, Hungary



Waters have always had an important role in social and economic development of the Körös-valley



Flooded areas around Szarvas, 1784



1906

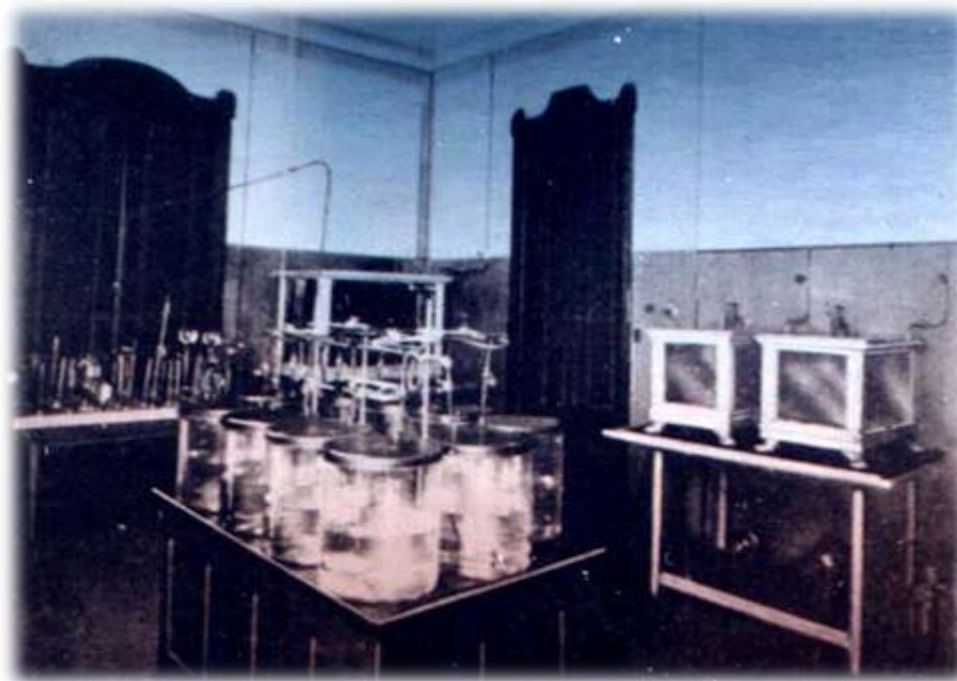
Aquaculture research started in Hungary, when the „Royal Experimental Station for Fish Physiology and Waste Water Purification” was established



Magyar biológiai tudományok miniszter-
elöljáróságára megengedem, hogy a-
hatalomra és a személyre, káros hatá-
sok megakadályozására káros hatá-
sokra. Magyar királyi hatalom-
mal és személyre káros hatá-
sokra. Magyar királyi hatalom-
mal és személyre káros hatá-
sokra.

Kélt Budaörsön 1906. február hó 3-án

János v. ...



Main milestones of the development of HAKI

1906 Royal Experimental Station for Fish Physiology and Waste Water Purification, Budapest

1953 Fish Farm of the Research Institute for Irrigation and Melioration (ÖTKI), Szarvas (Fish Culture Research Institute, Budapest)

1980 Fish Culture Research Institute (HAKI), Szarvas

2000 Research Institute for Fisheries, Aquaculture and Irrigation (HAKI) Szarvas



The center of HAKI



„Iskolaföld” fishpond complex of HAKI



The „HAKI complex” is a unique R&D, training and innovation center in fisheries, aquaculture and water management



HAKI





HAKI

is one of the 9 research institutions
of the

Ministry of Rural Development



Agricultural research institutes belonging to the Ministry of Rural Development



Main elements of R & D strategy of HAKI

- **Multidisciplinary research in active international collaboration for the development of sustainable aquaculture and agriculture systems**
- **Facilitate the application of research results and improve flow of information between science and practice**
- **Participation in international development assistance programmes for the improvement of livelihood in developing countries**



Main organisational units

(since 1st of July 2008)

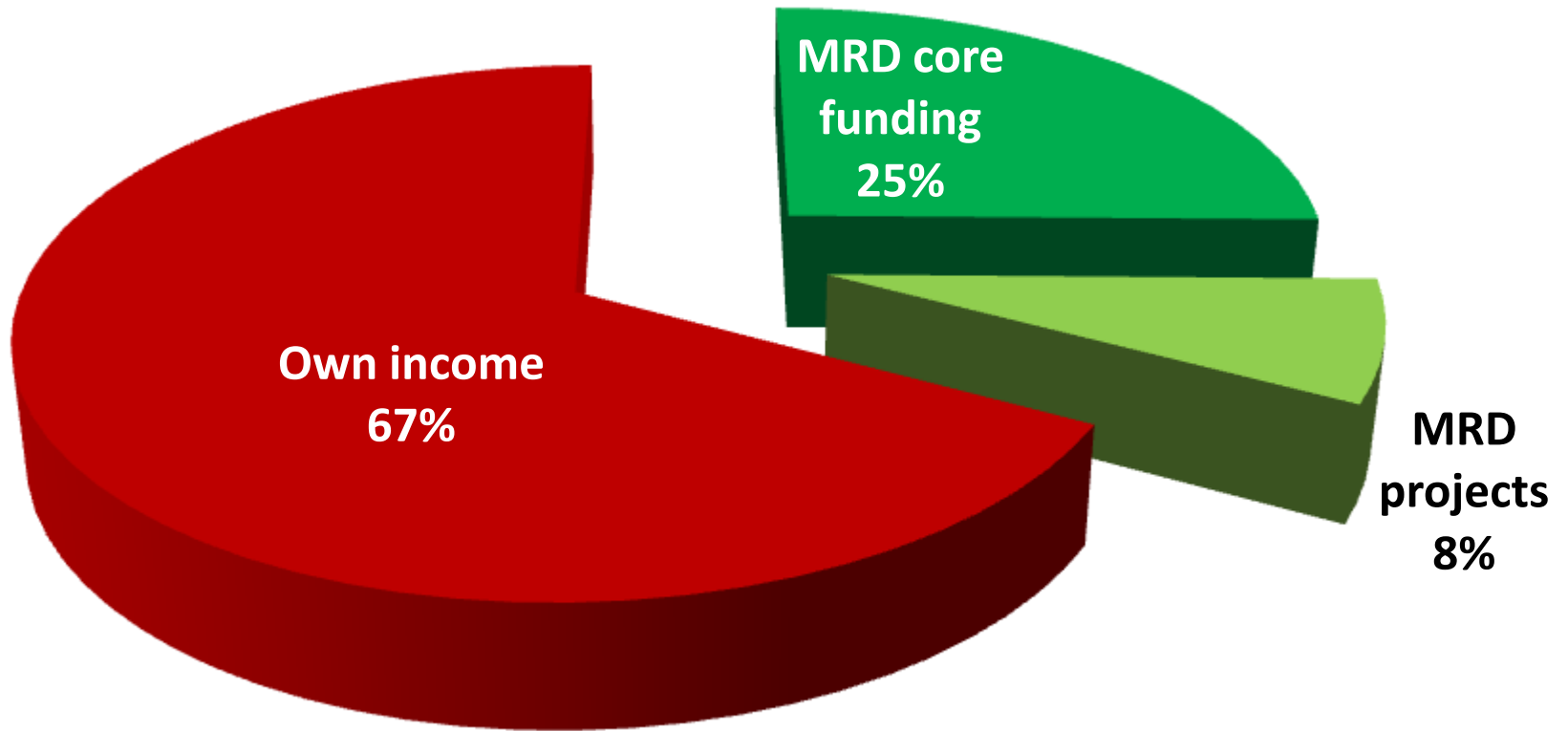
Research Departments

- Fish Biology
- Aquatic Resources Management
- Aquaculture Systems

Centers

- Environmental Analytics (certified laboratory)
- Extension and Innovation
- International Aquaculture

The incomes of HAKI in 2010 (2.6 million Euro)



MRD core fund is cut by 30% in 2011

Staff of the institute in 2010

Total permanent staff:	77
Scientists:	23 (11 Ph.D.)
Technicians:	30
Support personnel:	24
Contracted scientists:	5
Average age:	45 years
(staff with university degree):	40 years
Ratio of females:	42 %

Staff should be reduced by 10 % in 2011



Active European collaboration



FAO FID/FIRA (Fisheries and Aquaculture Resources Use and Conservation Division; EIFAC (European Inland Fisheries Advisory Committee) Aquaculture Sub-Commission



**EAS (European Aquaculture Society)
President (2004-2006): Laszlo Varadi, HAKI director**



EU funded projects and bilateral collaborations with institutions in EU member countries



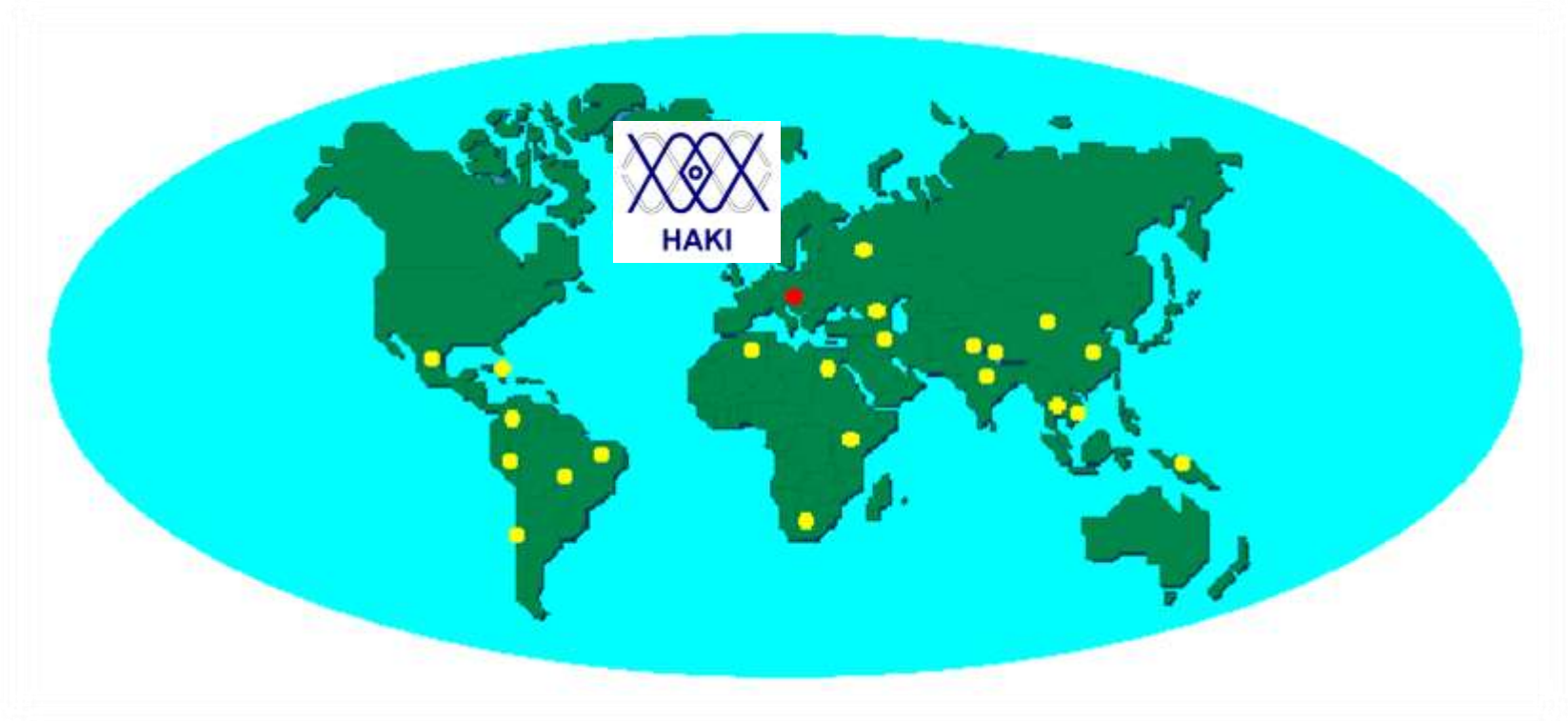
NACEE, Network of Aquaculture Centers in Central and Eastern Europe (Coordinating institute is HAKI)

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

Active participation in development assistance projects world-wide

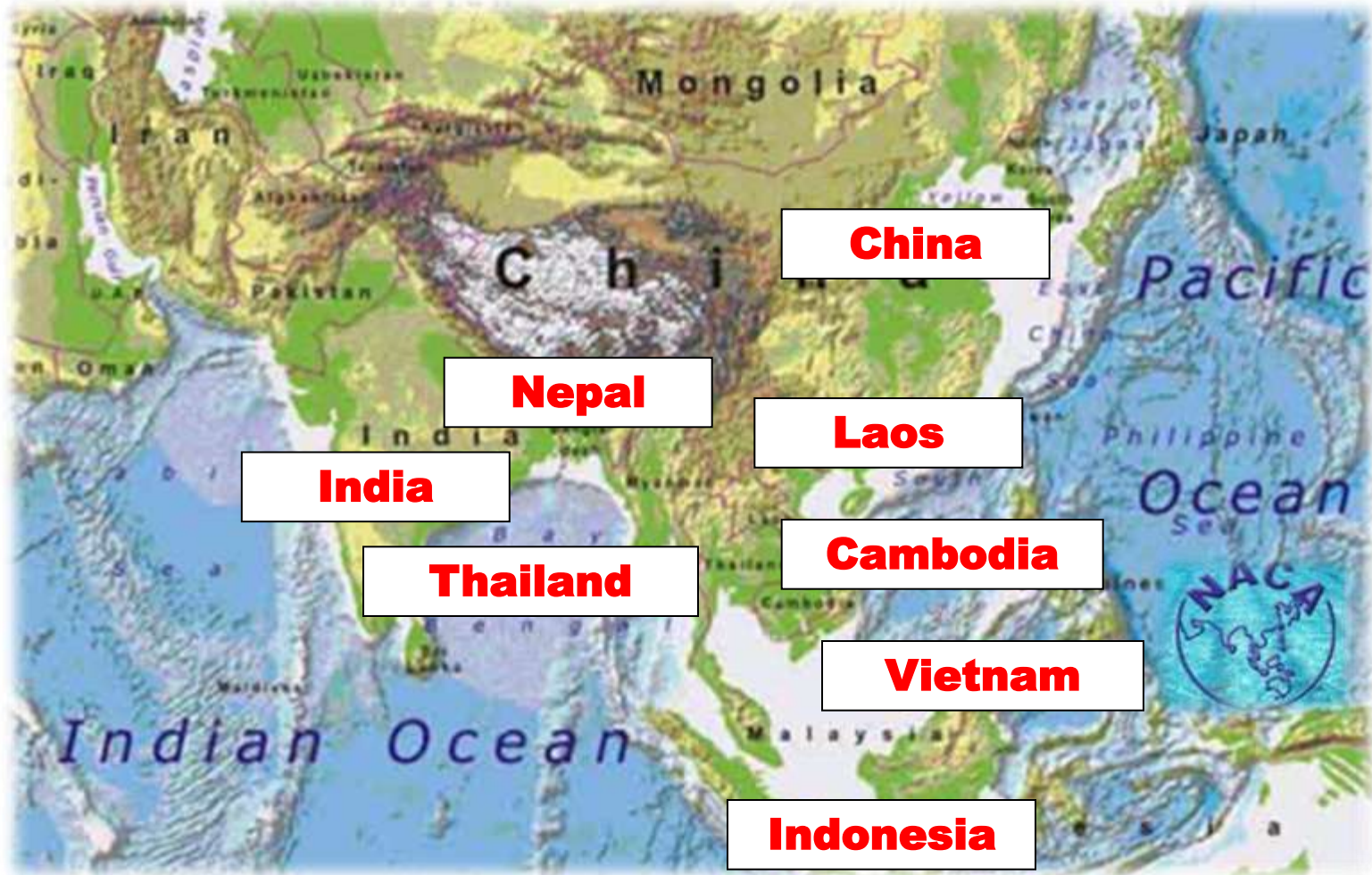


Expert consultancy

Postgraduate training

Supply of high quality common carp

Active collaboration with Asian countries





Main EU funded projects

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)



Hungarian ODA Projects in Asia

Vietnam:

Technical assistance to the development of fish seed and fish feed supply (*Budget: 500,000 USD*)

Vietnam: ODA „Micro Project”

Assessment the possibility of the construction of small feed mills in the region (*Budget: 13,000 USD*)

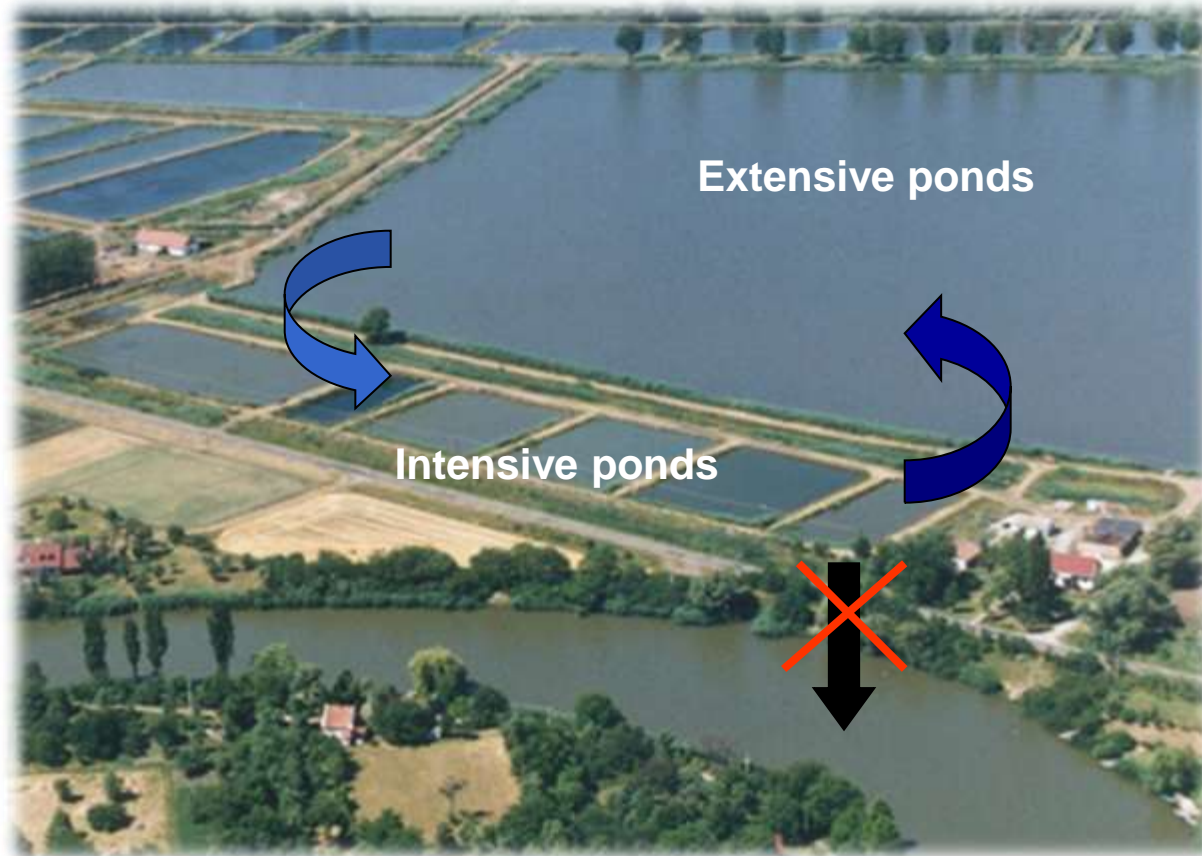
Laos: Tied Aid Loan Project

Development of fish seed and fish feed supply (*Budget: 8.6 million USD*)

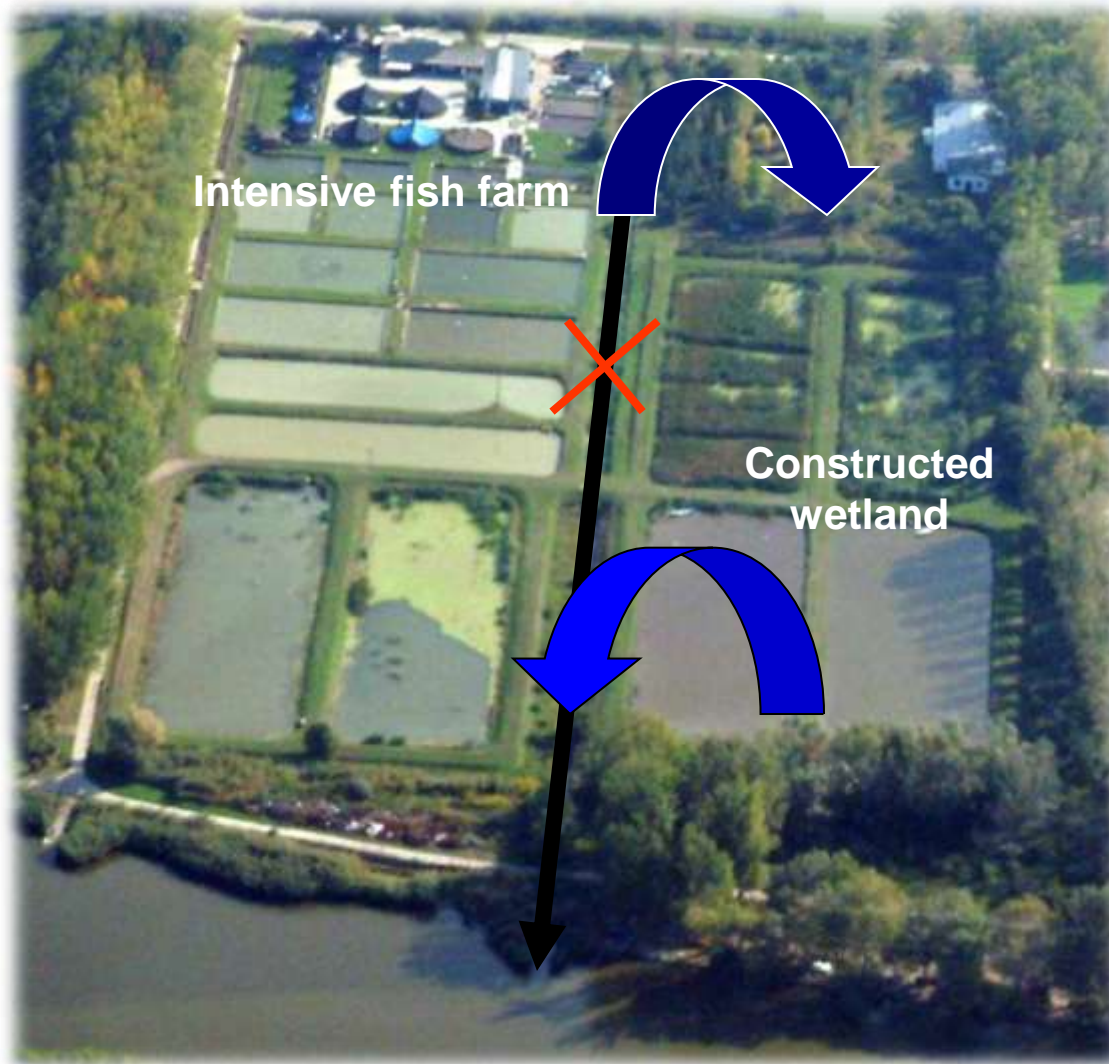


5. Examples of R & D projects for innovation

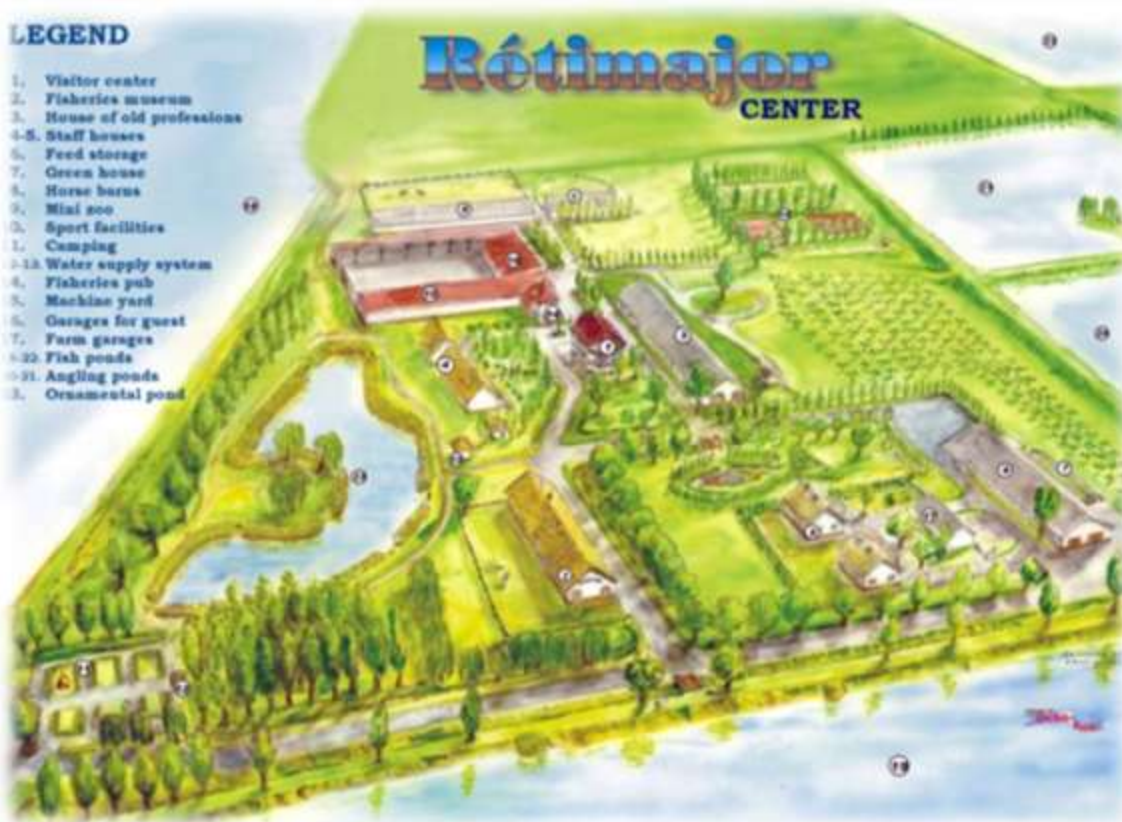
Combined intensive-extensive system



Effluent treatment in constructed wetland



Multi-functional pond fish farm



Higher and diversified farm income

New species and new technologies 1/2



African catfish *Clarias gariepinus*

New species and new technologies 2/2



Paddle fish *Polyodon spathula*

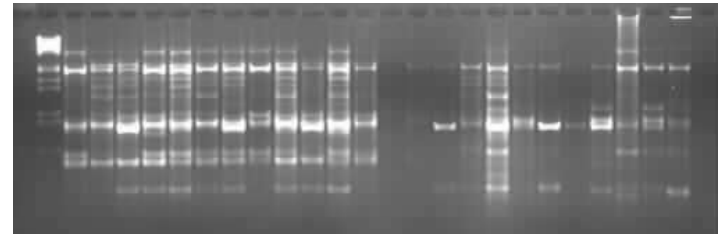
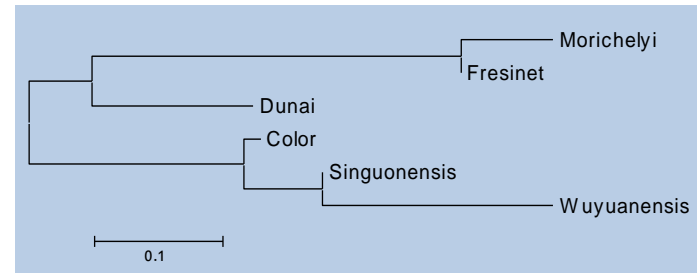
Gene banking and breeding of common carp



**Live gene bank
of common carp varieties**

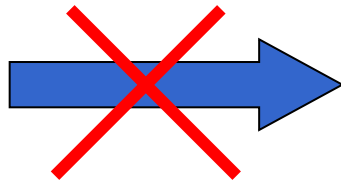
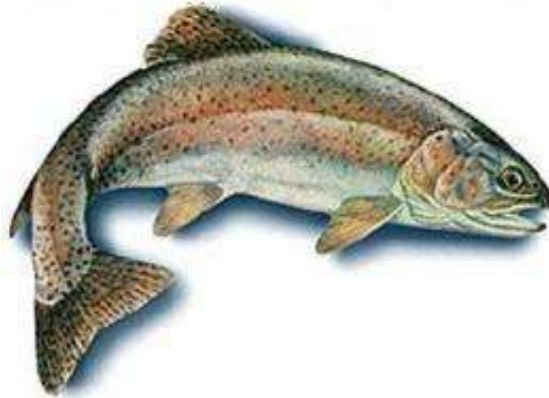


Genetic characterisation of common carp



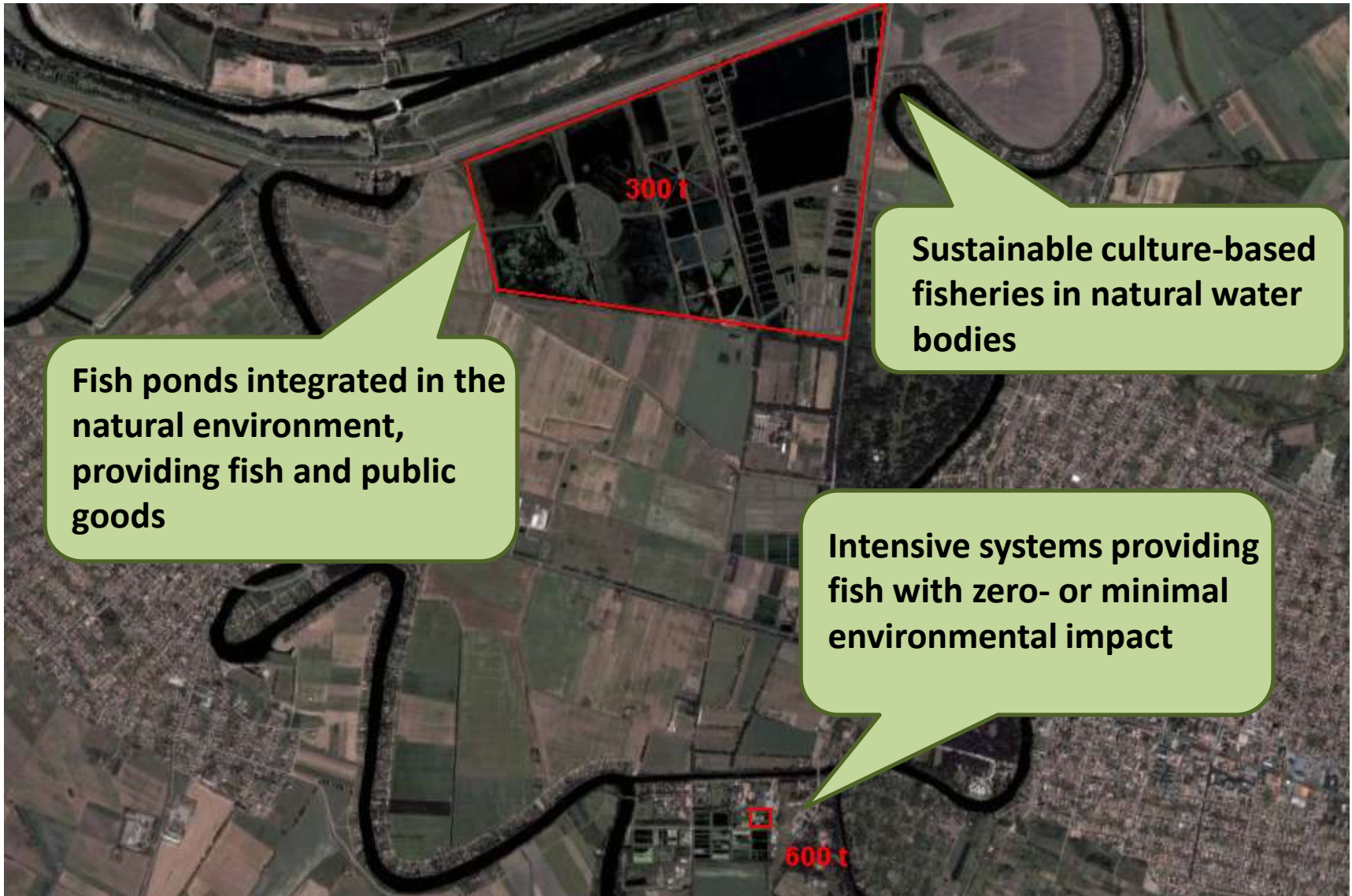
Better growth and disease resistance

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, providing fish and public goods

Sustainable culture-based fisheries in natural water bodies

Intensive systems providing fish with zero- or minimal environmental impact

Thank you for your attention