THE HUNGARIAN MULTIANNUAL AQUACULTURE STRATEGIC PLAN AND ITS RELATION TO THE EUROPE 2020 STRATEGY

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  – Development priorities and objectives

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AQUACULTURE IN HUNGARY

(a) Extensive freshwater aquaculture
(app. 25 000 ha production area)

• Ponds are maintained in such a way as to promote the development of aquatic fauna at a yield greater than that found in the natural ecosystem.
• Density is low and fish feed naturally. Certain producers provide additional feed (*wheat*, *corn*, *pea*, *lupine*)
• These ponds play an important and positive role in the landscape, water management and biodiversity.
• Key species: **Common carp** based polyculture with *Bighead carp*, *Silver carp*, *Grass carp*, *Pike*, *Pikeperch*, *European catfish* and *Prussian carp*.

(b) Intensive freshwater aquaculture
(app. 12 000 m³ production volume)

• In intensive system, fish are reared in tanks until they reach marketable size.
• There are two techniques:
  – Water cross-flow (**WCF**)
  – Recirculation (**RAS**)
• Recirculation systems are more costly (energy), but offer better control of breeding conditions (*temperature*, *oxygen*, *etc.*) and water quality.
• Key species: **African catfish**, *European catfish*, *Rainbow trout*, *Barramundi*, *Sturgeon*, *Tilapia*, *etc.*
MAIN CHARACTERISTIC OF THE HUNGARIAN AQUACULTURE

• Gross fish production:
  – 27-29 thousand tonnes/year and 43-44 million EUR/year:
    • Pond culture: 20 - 23 thousand tonnes
    • Intensive (RAS&WCF): 2.1-2.3 thousand tonnes
    • Inland fisheries: 6.3-6.5 thousand tonnes

• Import:
  – 19-20 thousand tonnes/year (45-46 million EUR/year)

• Export:
  – 2.0-2.2 thousand tonnes/year (5-6 billion EUR/year)

• Fish consumption:
  – Live fresh and refrigerated: 1.83 kg/capita/year
  – Frozen: 0.93 kg/capita/year
  – Canned, smoked, etc.: 1.02 kg/capita/year
  – Total: 3.78 kg/capita/year
DISTRIBUTION OF THE HUNGARIAN MARKET SIZE FISH PRODUCTION BY SPECIES (2012)

- **Common carp**: 67%
- **Bighead/Silver carp**: 11%
- **Grass carp**: 3%
- **African catfish**: 12%
- **Prussian carp**: 4%
- **European catfish (Wels)**: 1%
- **Others**: 2%

**TOTAL: 14 852 tones**

Source: Hungarian Research Institute for Agriculture Economics
CHALLENGES

• Decreasing marine landings vs. increasing demand for fish
• Trap of fish-meal/fish-oil
• Consumption of Common carp is slowly decreasing in EU
• Import dependency of the EU27 (*import 16 B EUR/year*)
• Community objectives should be followed:
  – **Sustainable development** should be encouraged;
  – More increased consideration of **environmental impacts**;
  – Increase of **competitiveness**, maintenance and improvement of **employment** should be guaranteed;
  – **Competitive and market-oriented production** and the necessary structure conversion should be promoted;
  – Guarantees for **food-safety, animal health** and **welfare**;
  – Promotion of economic effectiveness: priority to higher added value;
• EMFF source for Hungary (2014-2020): **39,1 M EUR**
Total EU Allocation of EMFF (2014 - 2020)

- **BE**: €41.7Mil.
- **BG**: €88.1Mil.
- **CZ**: €31.1Mil.
- **DK**: €208.4Mil.
- **DE**: €219.6Mil.
- **EE**: €101Mil.
- **IE**: €147.6Mil.
- **EL**: €388.8Mil.
- **ES**: €1.16KMil.
- **FR**: €588Mil.
- **HR**: €252.6Mil.
- **IT**: €537.3Mil.
- **CY**: €39.7Mil.
- **LV**: €139.8Mil.
- **LT**: €63.4Mil.
- **HU**: €39.1Mil.
- **MT**: €22.6Mil.
- **NL**: €101.5Mil.
- **AT**: €7Mil.
- **PL**: €531.2Mil.
- **PT**: €392.5Mil.
- **RO**: €168.4Mil.
- **SI**: €24.8Mil.
- **SK**: €15.8Mil.
- **FI**: €74.8Mil.
- **SE**: €120.2Mil.
- **UK**: €243.1Mil.

*Note: This chart represents the total EU allocation of EMFF from 2014 to 2020 across various countries, with each bar indicating the financial allocation in millions of Euros.*
## CONCEPT OF THE SUSTAINABLE POND FARMING IN HUNGARY

### Level of sustainability

<table>
<thead>
<tr>
<th>Nature</th>
<th>Environment</th>
<th>Social</th>
<th>Economic</th>
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<thead>
<tr>
<th>Global</th>
<th>Regional</th>
<th>Local</th>
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<tbody>
<tr>
<td>1. <strong>Sustainable</strong> fish production</td>
<td></td>
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<td>2. <strong>Sustainable</strong> enterprise economy</td>
<td></td>
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<tr>
<td>3. <strong>Sustainable</strong> pond farming</td>
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<td>4. <strong>Sustainable</strong> rural area</td>
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FUNCTIONAL ELEMENTS OF POND FARMING

No.1. Food production (technology)

No.2. Environment protection (renewable source)

No.3. Nature conservation (biodiversity)

No.4. Recreation (angling, tourism)

ECONOMIC
• Satisfying consumer needs
• Producing safe/healthy food
• Satisfying angler needs

SOCIAL
• Employment in rural areas (esp. women)
• Recreational activities
• Environmental-friendly consumer behaviour

ENVIRONMENTAL
• Production with less pollution/impact
• Protecting wetland habitats
• Sustaining biodiversity
• Rehabilitation after water pollution
<table>
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<tr>
<th>STRENGTHS</th>
<th>WEAKNESSES</th>
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<tr>
<td>- Favourable climatic conditions</td>
<td>- <strong>Degraded fishponds</strong>, low technical quality</td>
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<td>- High genetic value of common carp</td>
<td>- Low-qualified and aged work force</td>
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<td>- Fish ponds serve as aquatic habitats (high level of biodiversity)</td>
<td>- Significant regional differences in production conditions</td>
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<td>- Traditional production technology, which based on polyculture (multispecies-system)</td>
<td>- Significant variance in the quality of table-size carp</td>
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<td>- Absolutely <strong>GMO free</strong> production</td>
<td>- „Conservative approach of producers”</td>
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<td>- Pond fish culture is <strong>independent from the fishmeal</strong></td>
<td>- <strong>Low-level of innovation</strong></td>
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<td>- Water saving and environmental friendly fish production technology is well-known</td>
<td>- High rate of post-harvest and other losses</td>
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<td>- Traceable production in RAS</td>
<td>- Lack of connections in integration, low-level of organization of producers</td>
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<td>- Modern equipment and technology are available (e.g. RAS)</td>
<td>- Low <strong>energy efficiency</strong> in intensive production</td>
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<td>- EU harmonised national standard for organic fish production is available in pond farming</td>
<td>- Underdeveloped domestic fish feed production</td>
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<td>- Appearance of new species (e.g. Barramundi)</td>
<td>- Extremely „carp-centric” fish production</td>
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<td>- <strong>High intensity of EU support</strong></td>
<td>- Partly compensated ecology services</td>
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**AQUACULTURE (OT)**
**(POND FARMING AND INTENSIVE PRODUCTION)**

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<tr>
<th>OPPORTUNITIES</th>
<th>THREATS</th>
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<td>- Hungarian fish consumption is rising slowly but steadily</td>
<td>- Increased predation by birds (e.g. Cormorant)</td>
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<td>- Continuous expansion of angling market</td>
<td>- Increasing production costs induced by the extremely high grain prices</td>
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<td>- <strong>Priority in development of low trophic level (cereal-based) aquaculture</strong></td>
<td>- Appearance of Koi-herpes virus</td>
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<td>- Permit for the use of meat flour and blood flour in fish feed</td>
<td>- Water pollutions (e.g. cyanide in Tisza river)</td>
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<td>- Increased demand for the stocking of aquaculture-produced fish into natural waters</td>
<td>- Enhanced conflicts among environment protection, water management and farmers</td>
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<td>- Popularity of eco- and angling tourism</td>
<td>- Additional cost of complying with the strict regulations of animal welfare, environmental protection and nature conservation</td>
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<td>- Demand for technology transfer from developing countries</td>
<td>- Increased presence of import species (e.g. <em>Pangasius sp.</em>)</td>
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<td>- New funding scheme of EMFF 2014-20</td>
<td>- <strong>High level of VAT (27%)</strong></td>
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<td>- Increased demand for ecological services</td>
<td>- Prohibition of the production of protected aquatic species by law</td>
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MISSION STATEMENT

- The conservation and enhancement of natural values, especially aquatic habitats and the preservation of fisheries-related traditions in the changing social and economic environment as well as ensuring conformity with the functions of the sector, which are:
  - **ECONOMIC:** production function (production),
  - **ECOLOGIC:** protection and enhancement of nature and environment (environmental protection),
  - **SOCIAL:** welfare function, i.e. serving relaxation, recreation (tourism, recreation, health protection).

- **Main activity areas:**
  - Sustainable, competitive and safe production;
  - Job creation and maintenance in rural area;
  - Production of safe and healthy food for consumers by environment friendly technology;
  - Contribution for maintenance of wetlands and biodiversity;
PRIORITIES (1-5)

1. Specific investment (development) funding to improve the sustainability and competitiveness of the sector via 1) innovation (2) higher added value, (3) energy- and cost-efficiency & renewable energy use, (4) higher quality production, (5) protection of natural environment.

2. Increased co-operation within the product chain in order to utilize market potentials on a higher level.

3. Participation in food quality schemes, to introduce information systems, collective marketing activities and the enhancement of producers organizations.

4. Supporting young fish farmers to establish/develop their enterprises for a better age structure.

5. To expand professional skills and innovativeness of fishermen to increase the competitiveness and sustainability of aquaculture via the improvement of consultancy services.
PRIORITIES (6-10)

6. To encourage the introduction and production of new fish species with good market potentials.

7. More attention to preventive measures relating epidemic fish diseases, especially Koi herpes virus.

8. The key to the development of aquaculture is primarily based on: the improvement of human capital, the renewal/modernisation of production resources, innovation for the diversification of the sector as well as high quality production.

9. Forulmation of diversified and at the same time multifunctional fish farms should be targeted for environmentally sustainable production.

10. The ecology services of fishponds should be subsidised from EU and national funding.
## MAIN OBJECTIVES OF NATIONAL AQUACULTURE STRATEGY (NAS)

| ✓ | To ensure the long-term sustainability and competitiveness of aquaculture. |
| ✓ | Providing **healthy food** for the population by producing **high quality, healthy fish meat**. |
| ✓ | To increase Hungarian **fish consumption** and promote healthy diet through producing and distributing healthy fish products with high biological value. |
| ✓ | Promoting the **diversification** of pond farming ((1) **multifunctional extensive**; (2) **semi-intensive** and (3) **intensive ponds**) |
| ✓ | Promoting „**new species**” production technology and the renewable energy usage, especially the geothermal and solar energy sources |
| ✓ | To enhance the **cooperation** between researchers and farmers. |
| ✓ | Promoting the **knowledge transfer** and exchange of best practices. |
| ✓ | Promoting the **market competitiveness** of fishery products in Hungary. |
| ✓ | The improvement of the competitiveness of the Hungarian fisheries sector based on the practical application of **research results**. |
| ✓ | Ensuring the good **health status** of the domestic fish fauna. |
| ✓ | Enhancing the precision fish production (RAS) and fish processing sector. |
MAIN INDICATORS OF THE NATIONAL AQUACULTURE STRATEGY (NAS)

- Increasing of the fishpond production by 15%;
- Reconstruction of 2,000 ha fishpond (extensive);
- Construction of 1,000 ha new fishponds (extensive/semi intensive/intensive);
- Increasing the intensive (RAS) fish production by 10%;
- Building 7 new precision aquaculture farms based on RAS technology;
- Increasing of the domestic fish consumption by 1 kg/capita/year (6 kg/capita/year by 2020);
CONCLUSIONS

• The basic aims: fostering environmentally sustainable, resource efficient, innovative, competitive and knowledge-based aquaculture;

• All of the priorities of the NAS are based on the complex SWOT analyses;

• The goals of NAS will be reached to meet the EMFF priorities

• The main source of implementation of NAS are the EMFF and the national co-financing

• Strategic development should serve parallel the improvement of competitiveness, increase domestic fish consumption and meet the sustainability criteria.

• The central element of the NAS is the INNOVATION
HANK YOU FOR YOUR KIND ATTENTION!