

# Balancing Agriculture and Lake Ecosystems: Addressing Non-Point Source Pollution in Lake Balaton Basin, Hungary.

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A satellite map of a mountainous region, likely in the Andes, showing a network of yellow lines representing administrative boundaries. A prominent cyan-colored lake is visible in the center of the image. The terrain is rugged and forested, with some snow-capped peaks on the left side.

**Lake (Basins) vs. River (Basins)**

**Rural areas vs urban areas**

**Natural Units (Functional areas) vs. Administrative areas**

Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
Image Landsat / Copernicus

Google

# Multipurpose use of lakes

Sensitive complexity of nature – economy – society interactions

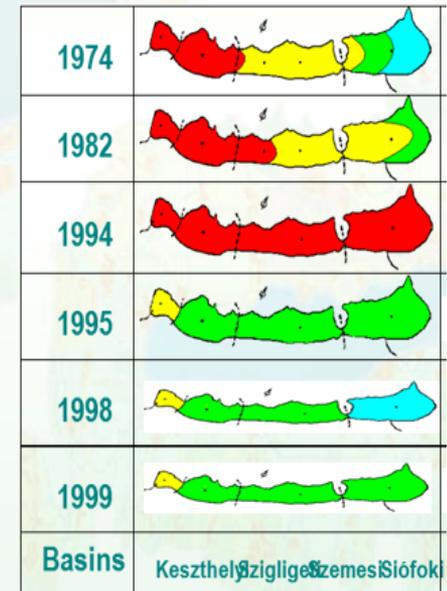


# Environmental costs force management measures

- Eutrophication, intensive agriculture (1970-1990)



- Emerged in the early 70's
  - eutrophication accelerated
  - mass blooms of blue-green algae
  - devastation of fish populations
  
- Action Plan was set by the Government to reduce nutrients loads
  - Sewage system development
  - Reduction of effluents limit of P of WWTPs
  - Control of livestock breeding
  - Dredging in most polluted areas
  - Reconstruction of Kis-Balaton wetland

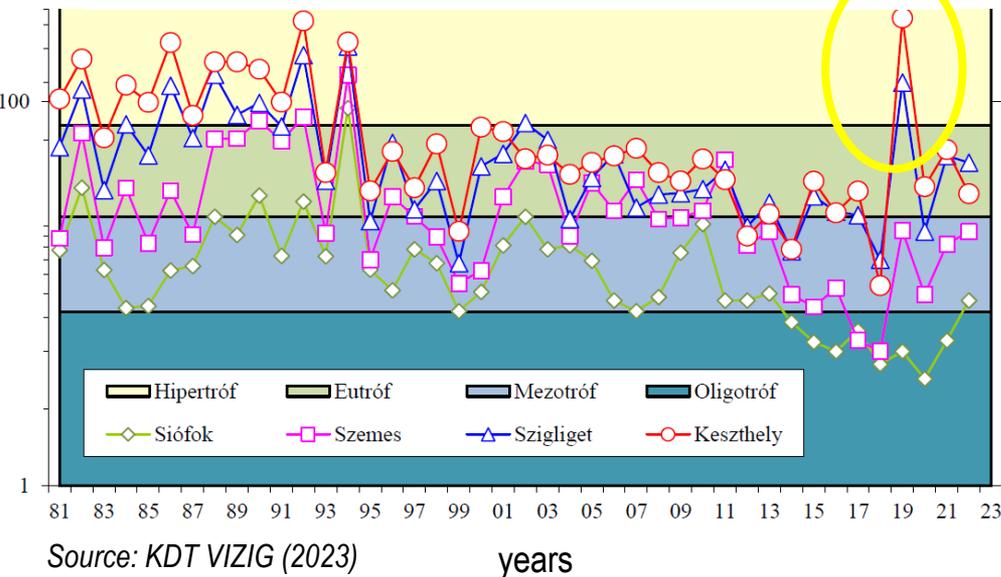


+ (agro)-economy changes  
(reduction of fertiliser and pesticied usages)

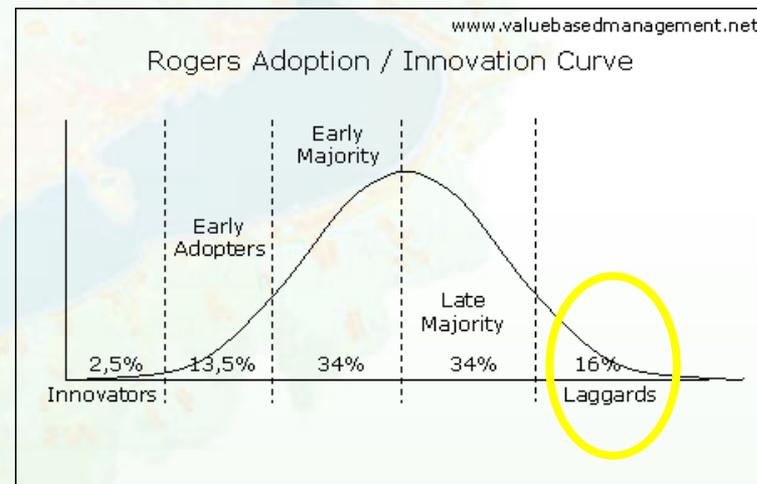
OECD classes	Oligotróf	Mezotróf	Eutróf	Hipertróf
	8 < $\mu\text{g/l}$	8-25 $\mu\text{g/l}$	25-75 $\mu\text{g/l}$	> 75 $\mu\text{g/l}$

# (Do) Management measures hide environmental costs (for a while?)

Annual maximum of Chl-a concentration (1981-2022)

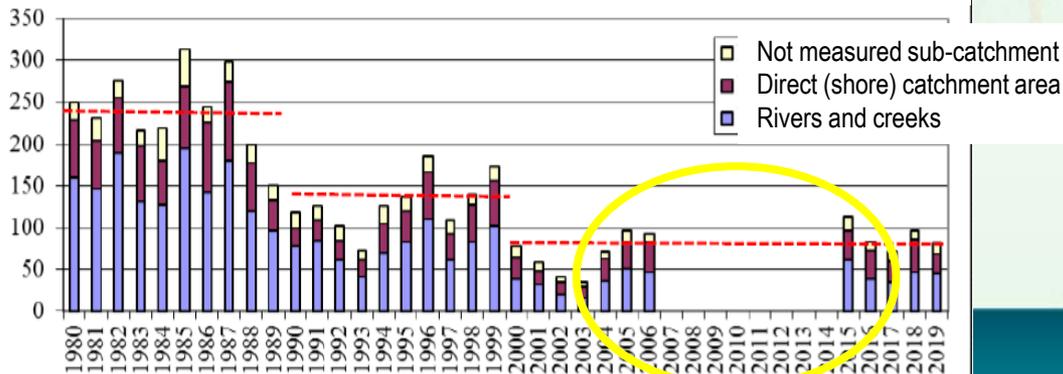


Regulations have been set accordingly?!



Total P (t/year)

Source: Dr. Clement A. (in BLKI 2021)

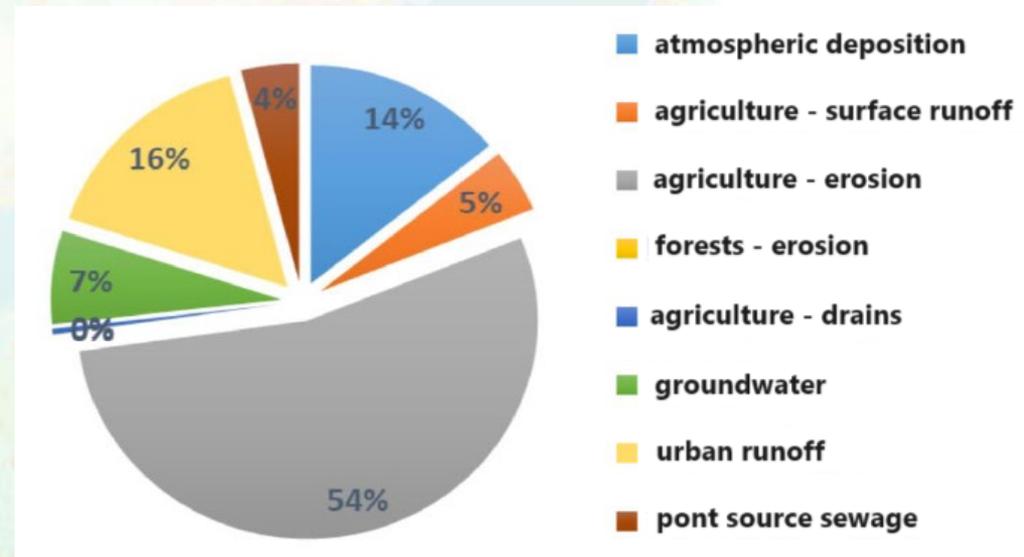




### Distribution of P emissions calculated with the MONERIS model according to sources in the total P loading of Lake Balaton

„check list” to review:

- DATA collection and assessment
- MONITORING and reporting
- COLLABORATION with regional organisations
- LONG-TERM PLANNING that consider the issue
- STAKEHOLDER engagement
- RESEARCH and innovation (new solutions to reduce pollutions)
- TARGETED investments
- FUNDING and grants
- ...



Source: Dr. Clement A. (in BLKI 2021) after Jolánkai és mtrsi, 2020

Joint monitoring program was (re)-launched in 2021

- „Lóczy Lajos” program



## Overall aim:

Ensuring the sustainable utilization of Lake Balaton by taking society's lake use priorities into account to the greatest extent possible, within the carrying capacity of the lake's natural assets.

## Activities

- **Establish and maintain an intersectoral, integrated, real-time monitoring system** for Lake Balaton Region
- **Fulfilment of the monitoring system** with valid, current, relevant data
- **Intersectoral data-sharing!**

## Further aims...

- Decision-support in policymaking
- Supporting institutional cooperations for regional management and development
- Supporting the establishment and follow-up of development plans of the region

... if you have any questions,  
please contact us:

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