Aquaculture and its development challenges

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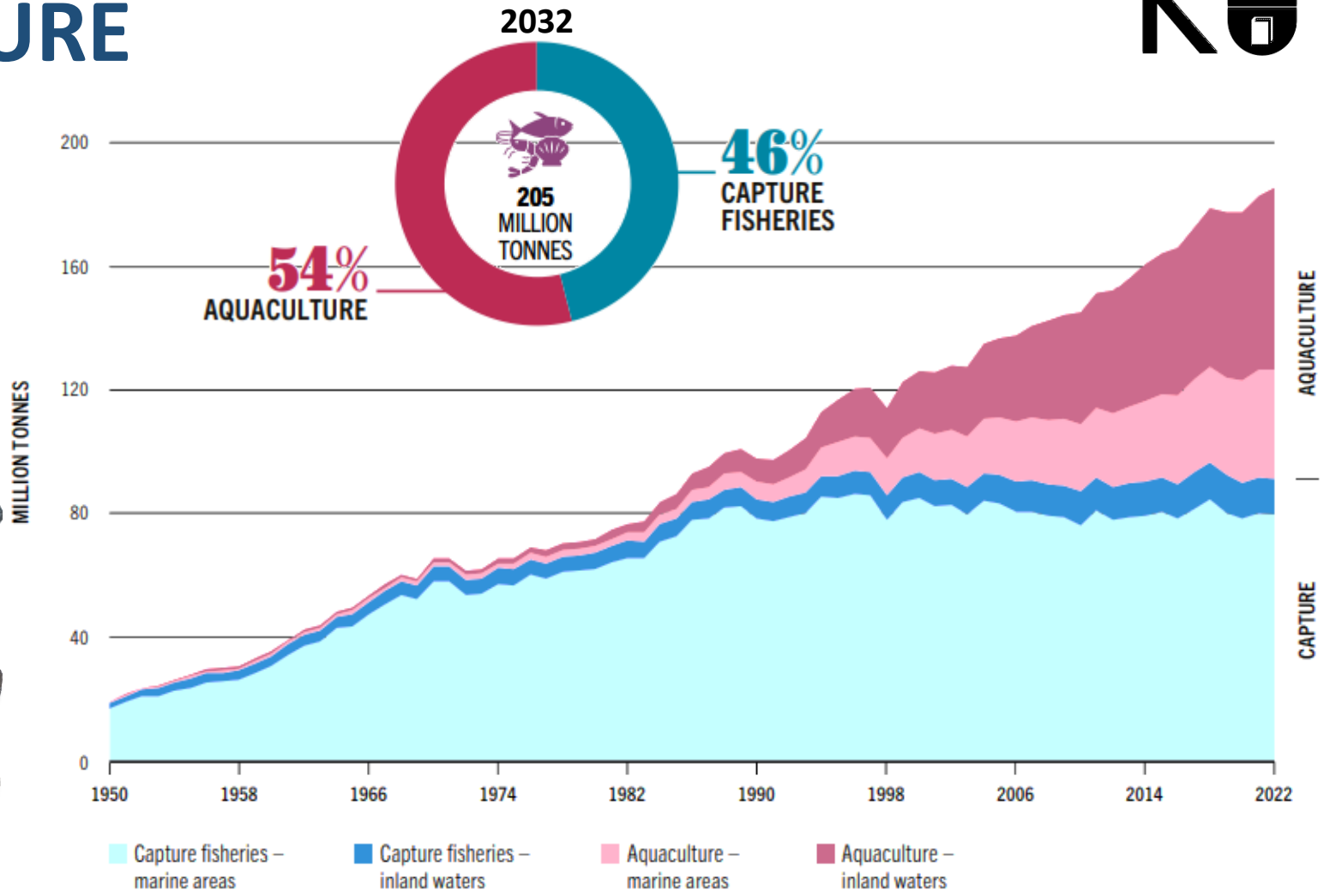
WORLD AQUACULTURE

Aquaculture – promising solution to meet global seafood demands when capture fishery is stagnating



SOURCE: UN FAO SOFIA, 2024

WORLD AQUACULTURE

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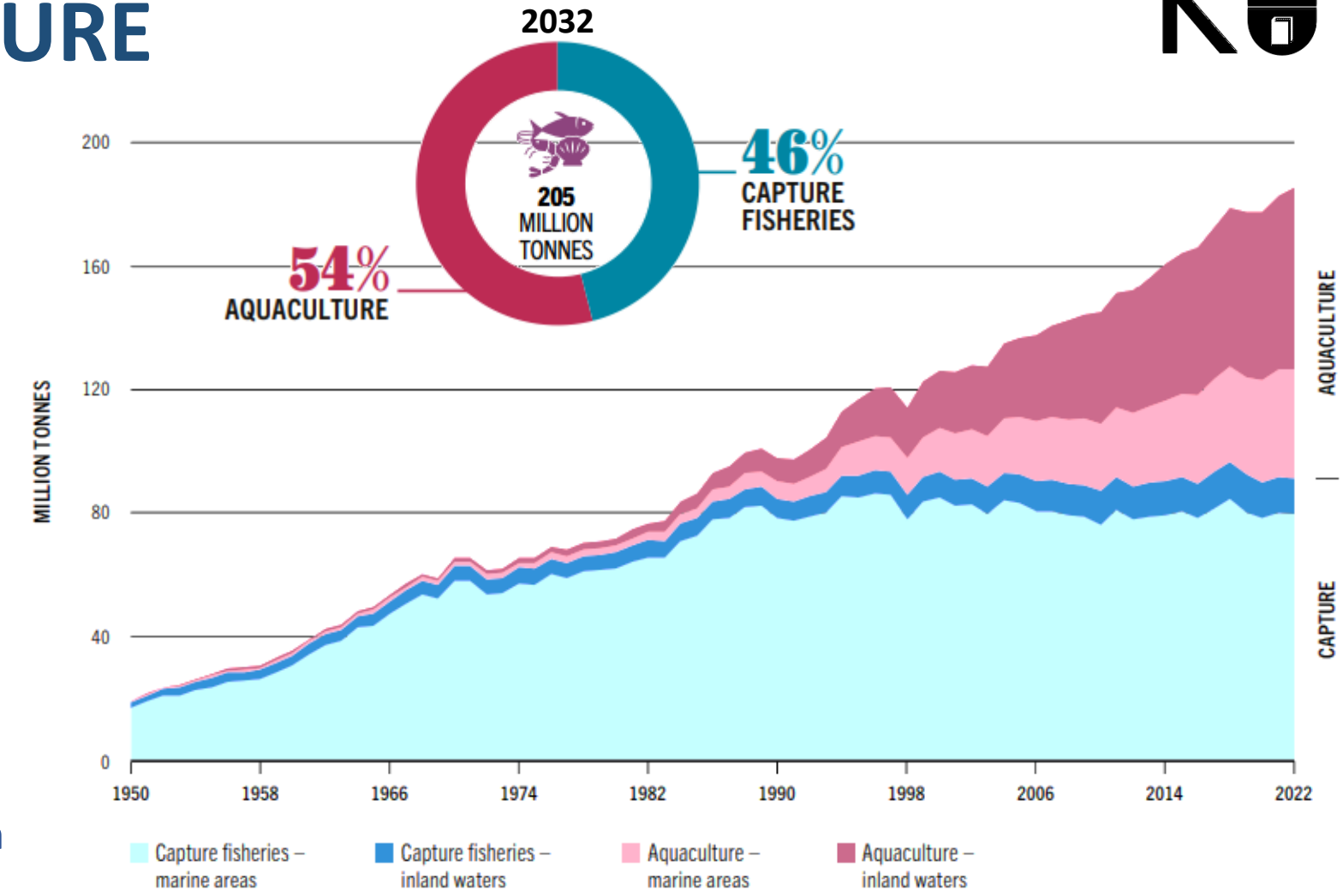


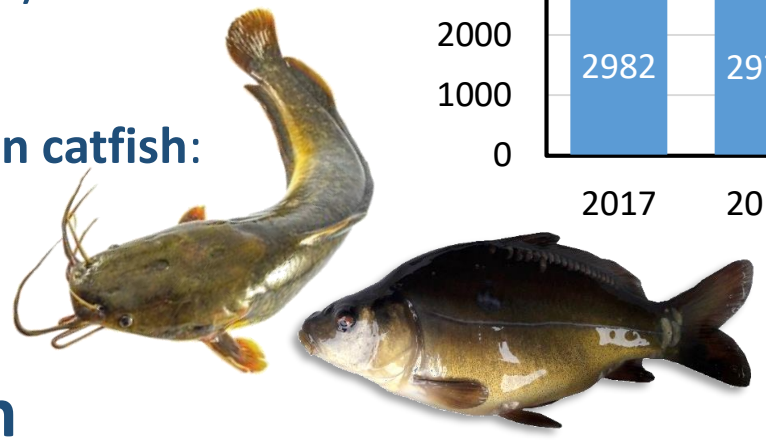
SOURCE: UN FAO SOFIA, 2024

Challenges of European aquaculture:

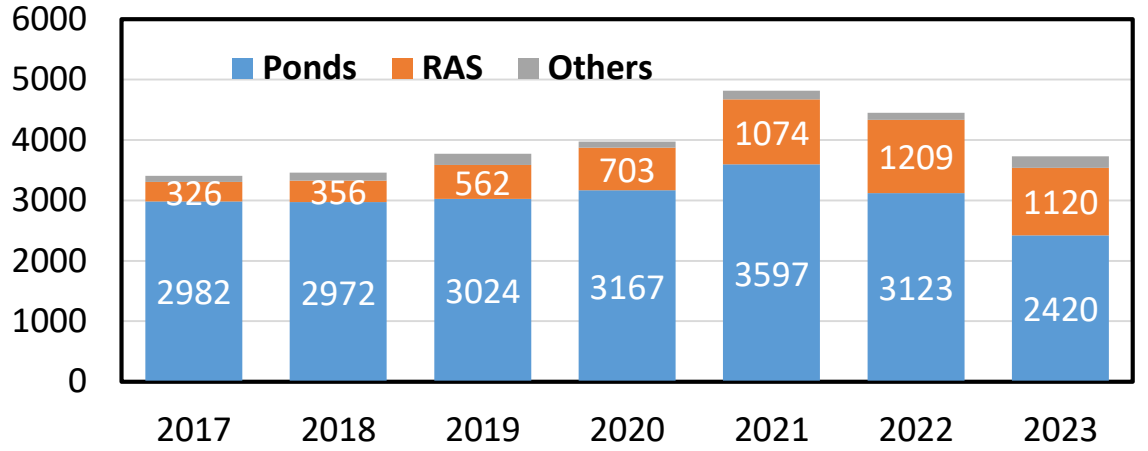
- Environmental issues
- Circularity – reduction of wastes
- Increase efficiency of production
- Energy costs
- Dependency on fish meal and oil
- Public / consumers perception

LITHUANIAN AQUACULTURE

- **58 farms** in 2023
- **418-443 employees** in the sector (in 2019-2023)
- The capacity of ponds is almost fully used
- ~95% of pond production is **carp**
- RAS sector produces mostly **African catfish**: 80 % – in 2023.

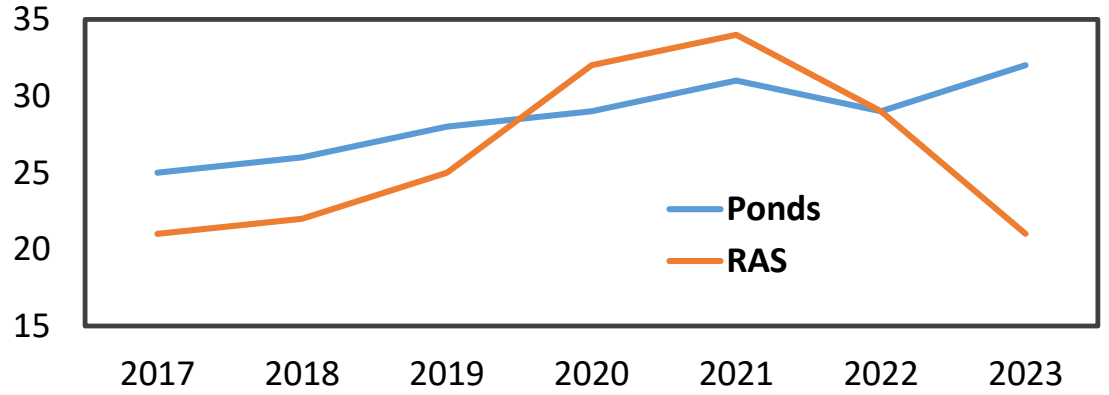


Structure of Lithuanian aquaculture sector (tons of production)



- **Challenges of Lithuanian aquaculture:**
- **Low growth potential in pond and sea aquaculture**
- **Slow growth in scale and use of innovations**
- **Lack of know-how and qualified specialists**
- **Low diversity of cultured species**

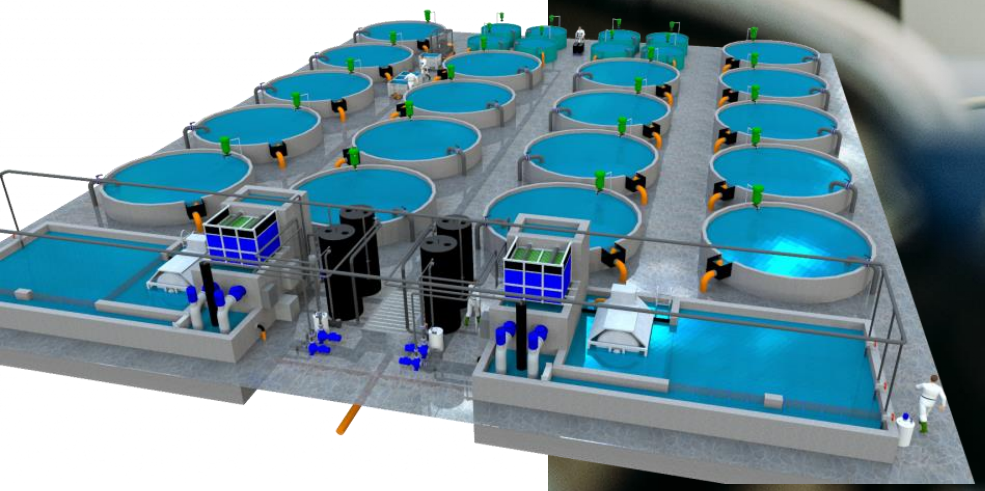
Number of aquaculture subjects



SOURCE: Ministry of Agriculture and Lithuanian Statistics Department

FOR THE GROWTH OF RAS SECTOR, WE NEED:

- Clear long-term vision
- Technology development
- Qualified specialists
- Marketing strategy



Klaipeda University (KU) is an important stakeholder to reach ambitious blue goals of the region

- New strategic science direction **Towards sustainable technologies, blue and green growth and healthy sea**

  →a specific priority on **Sustainable management of marine resources through the development of aquaculture and blue biotechnology**

- Member of Submariner Network for Blue Growth

- Member of EU Conexus

SUBMARINER NETWORK

EU CONEXUS
European University for Smart Urban Coastal Sustainability

FISHERIES AND AQUACULTURE LABORATORY

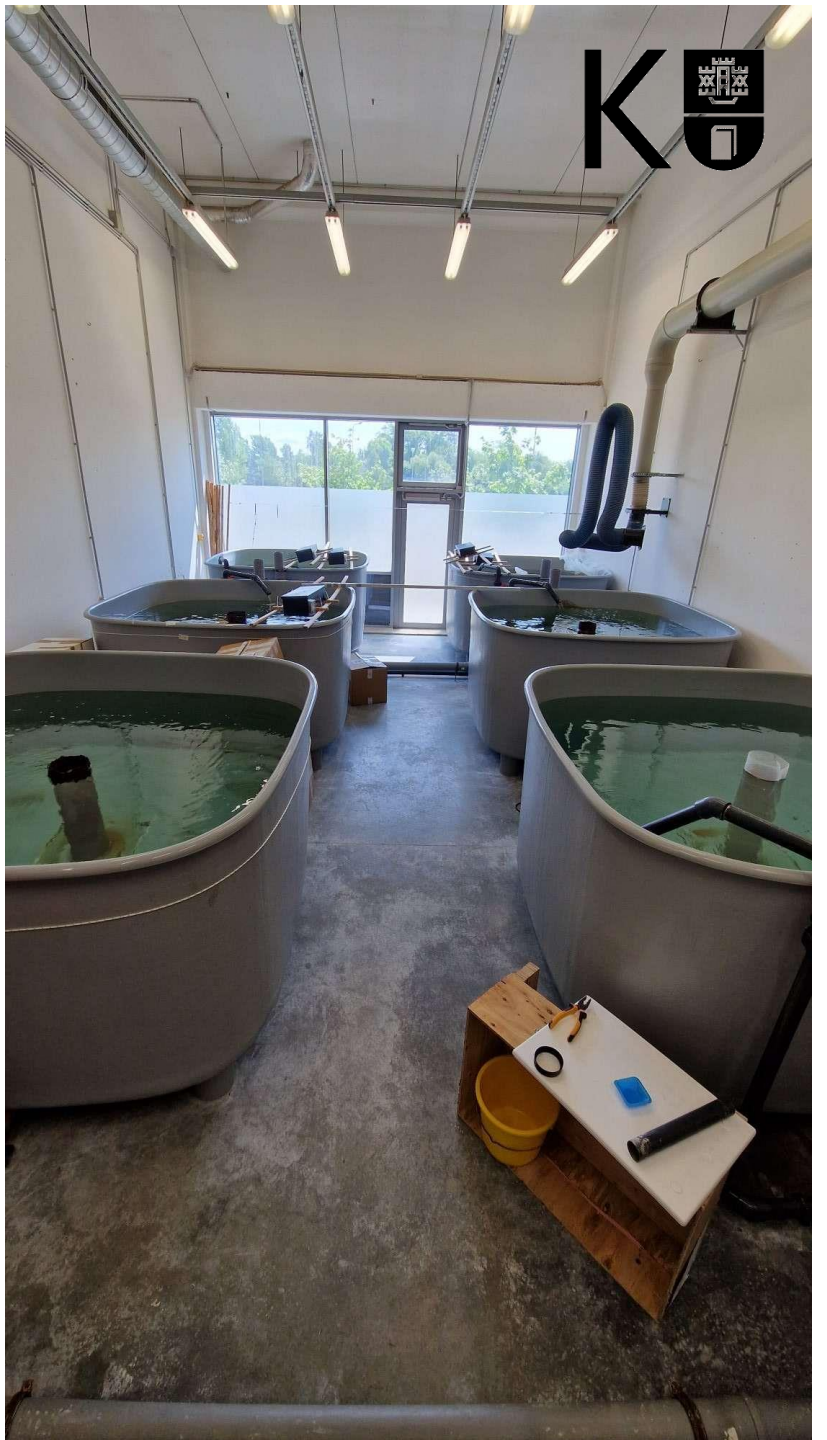
RAS technology development

- Recirculating aquaculture systems
- Shrimp cultivation technology
- Geothermal resources
- Aquaponics

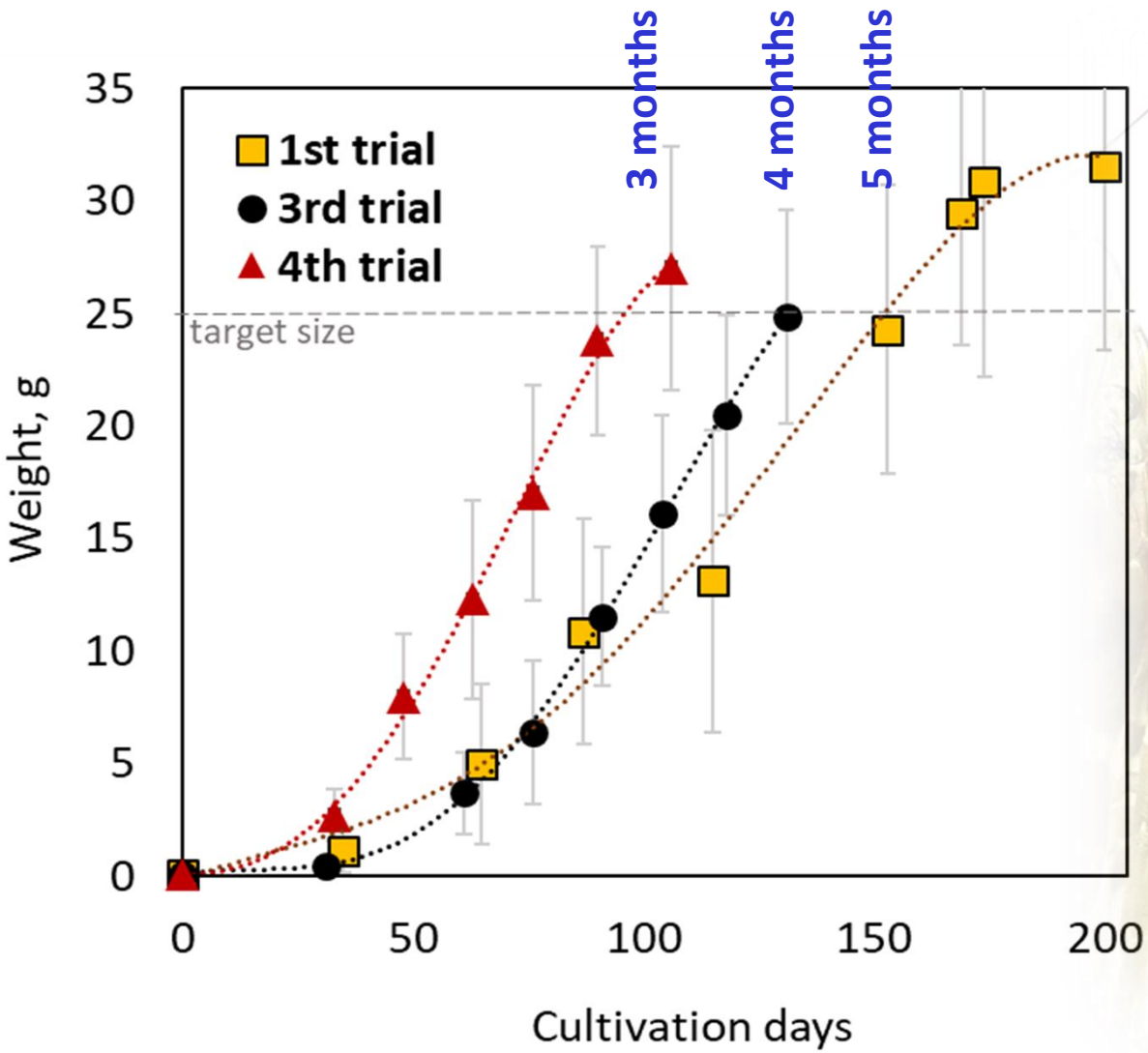
PILOT SHRIMP RAS IN LITHUANIA

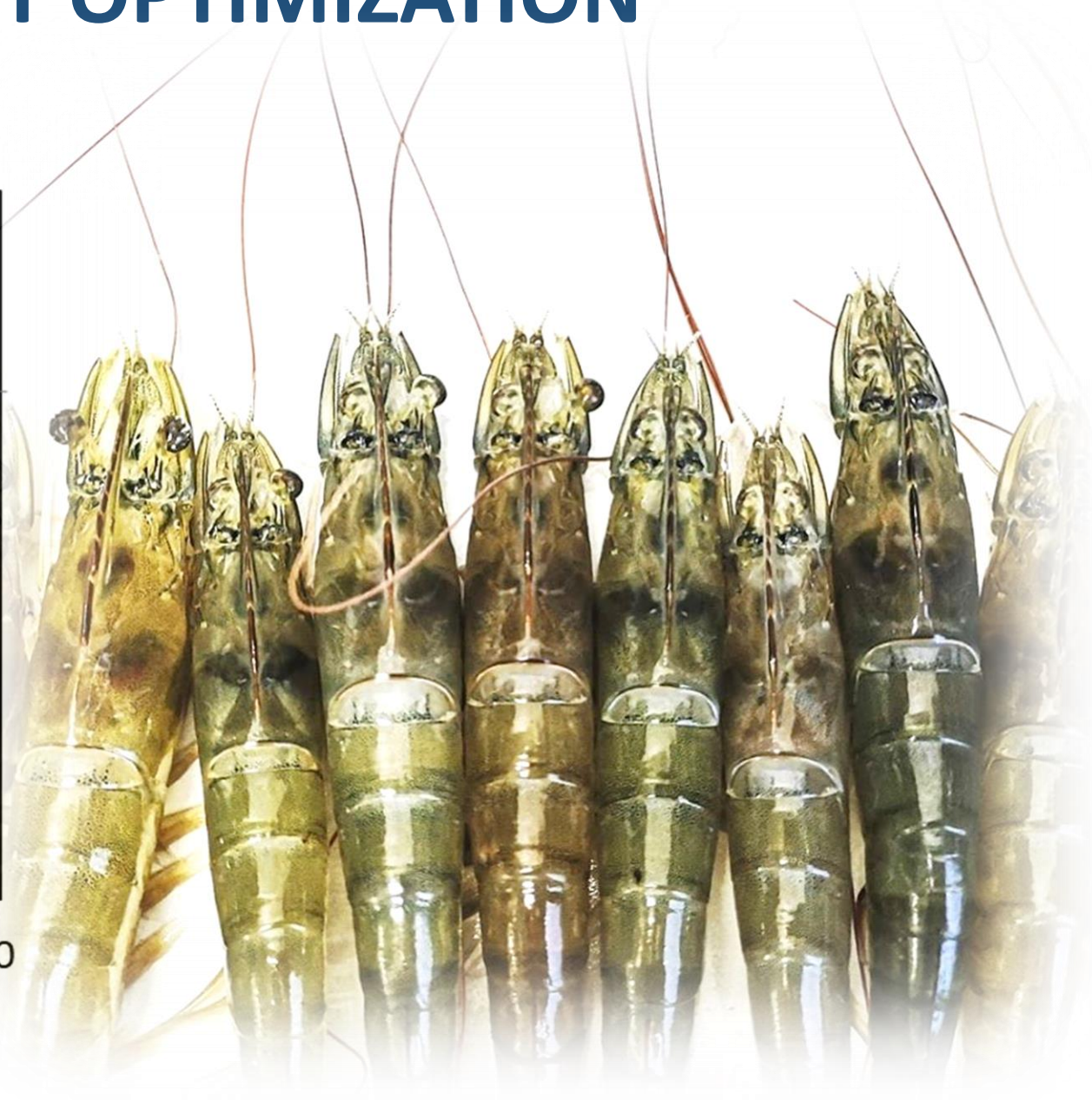
KLAIPĖDOS MOKSLO IR TECHNOLOGIJŲ PARKAS

Created in 2018 within InnoAquaTech project at KMTP Business Incubator for development of shrimp RAS technology and commercialization of acquired know-how supporting local businesses



SHRIMP RAS TECHNOLOGY OPTIMIZATION





SHRIMP RAS TECHNOLOGY OPTIMIZATION

Extra surface area **– Shrimp tower** concept

EXTRA SURFACE AREA – MORE PRODUCTION

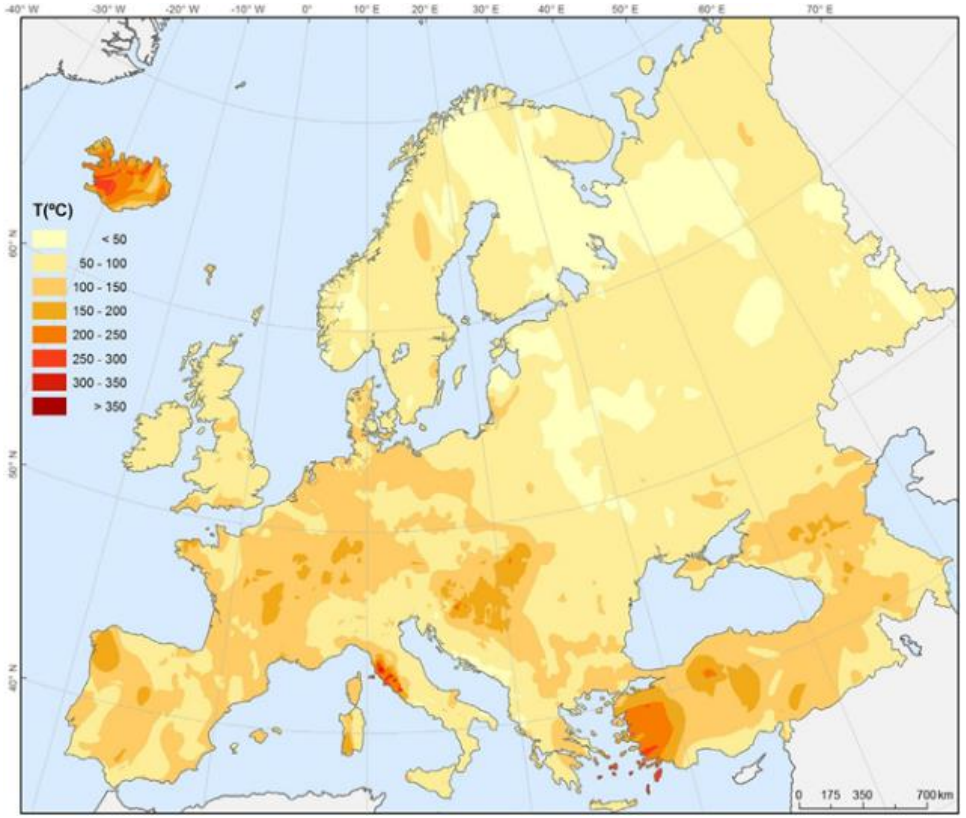
Multi-layer bottom approach

Houden van vis. Seafarm

EXTRA SURFACE AREA – MORE PRODUCTION

ARTIFICIAL MARINE WATER

- High operational costs for professional sea salt **~10 Eur/1m^3 of 6PSU water**
- **Geoterma power plant** – 1100 m deep Devonian aquifer with 38^{o}C and 110 g L^{-1} mineralisation geothermal water (brine)
- **Geothermal brine – sustainable source of salt for artificial marine water?**



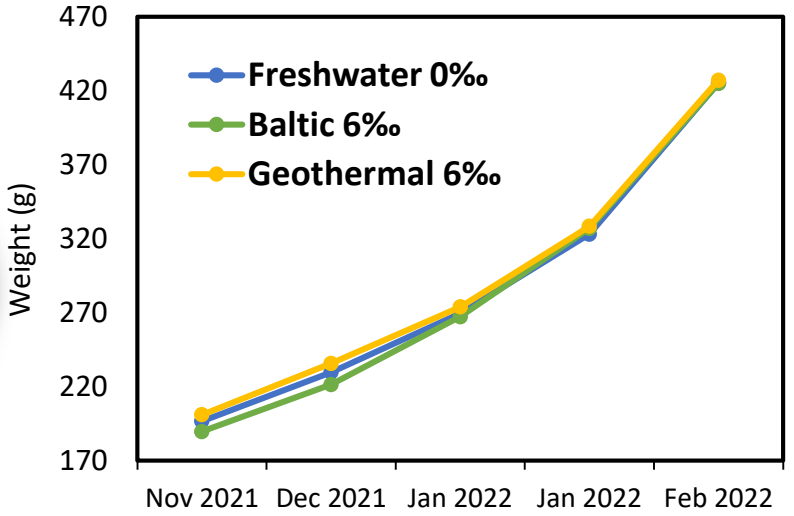
Western Lithuanian Geothermal Anomaly

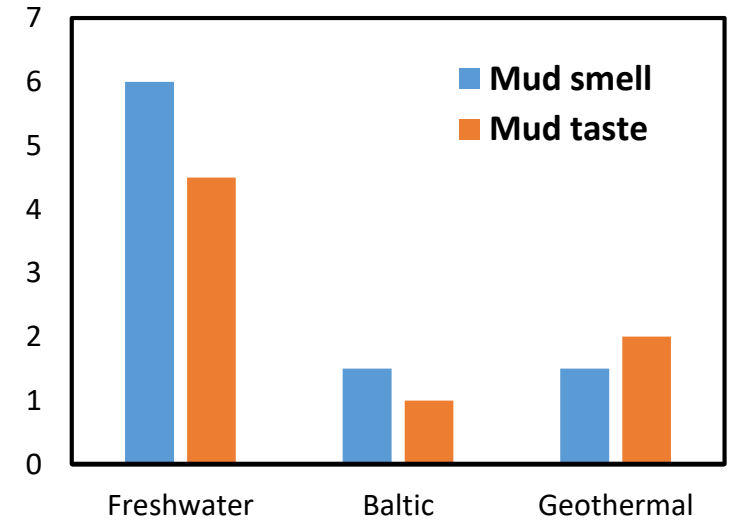
Geothermal brine for water salting in RAS

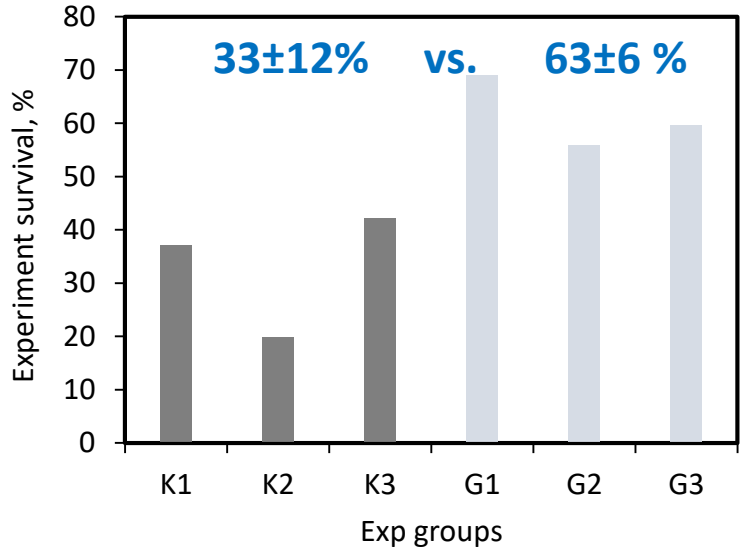
Interreg Baltic Sea Region

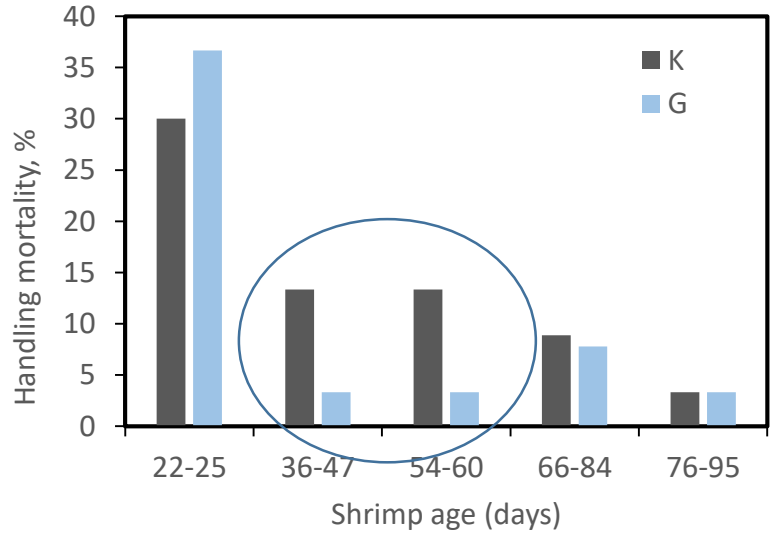
Co-funded by the European Union

BLUE ECONOMY TETRAS







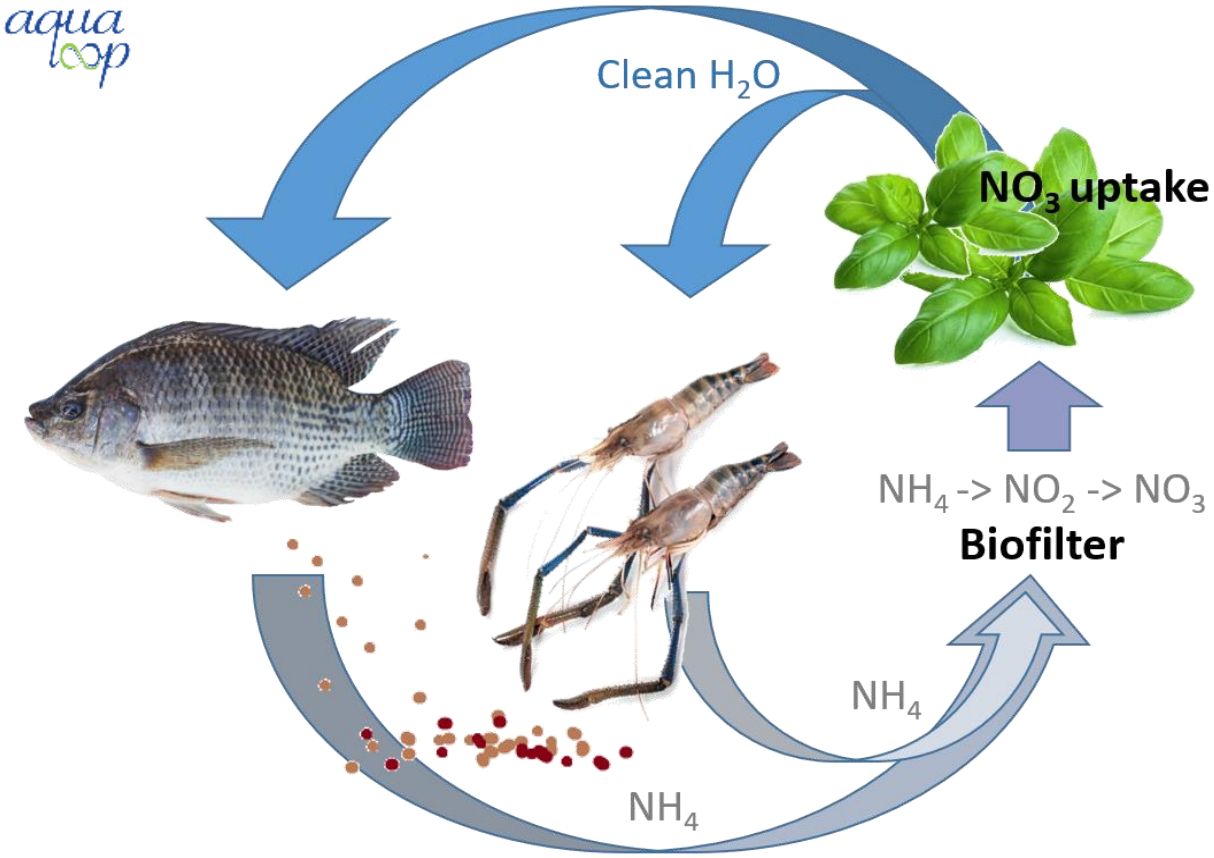


Aquaponics – circular economy principles in RAS

Interreg South Baltic

Co-funded by the European Union

aqua loop

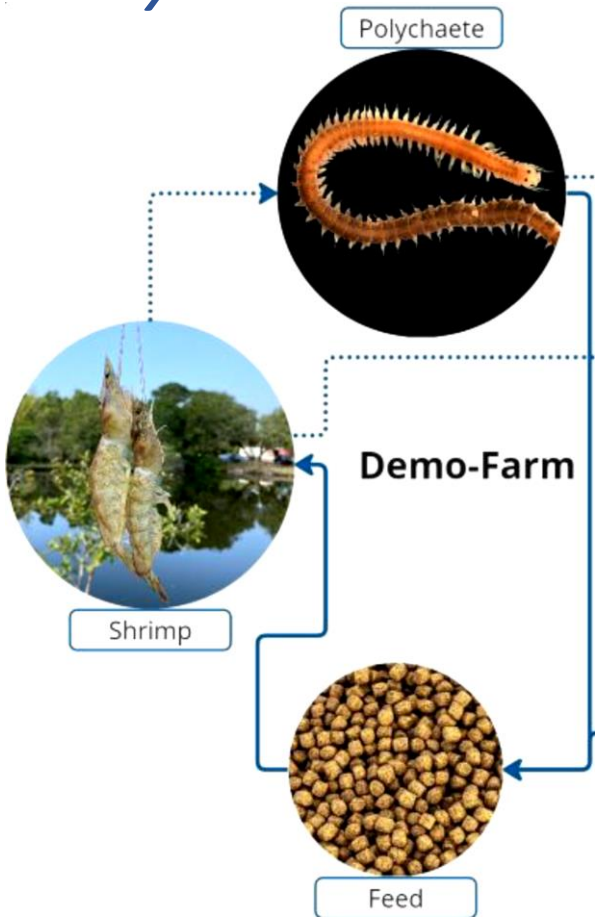


FISHVISA pilot – development of the **Fi**sh-**SH**rimp-**V**egetables **I**ntegrated **S**ystem of **A**quaponics to showcase the potential of circular economy principles in RAS

KLAIPĖDOS MOKSLO IR TECHNOLOGIJŲ PARKAS

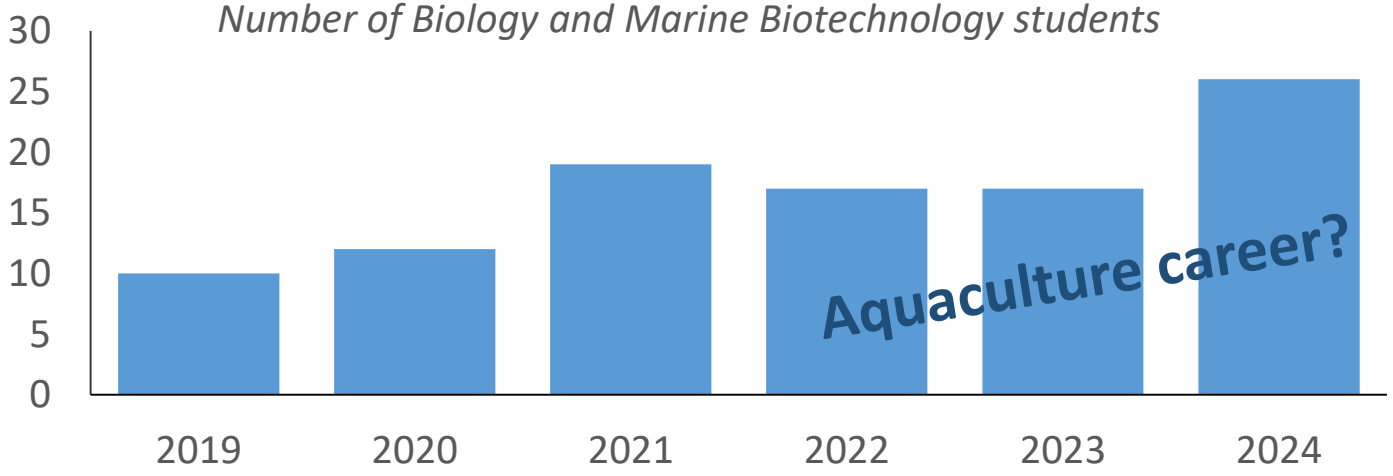
Era Net ProRMAS *Producing valuable proteins and organic fertilizers from saline water sources using a recirculating multitrophic aquaponic system*

- **Green ERA-HUB** on agri- food and biotechnology
- LP – **Alfred Wegener Institute (Germany)**
- PP2 – **Klaipeda Science and Tecnology Park**
- PP3 – **Università di Padova (Italy)**



AQUACULTURE EDUCATION

- **Biology and Marine Biotechnology** bachelor program at KU
- EU Conexus Joint master study program **Marine Biotechnology** (with strong focus on aquaculture)
- **STEAM center** for non-formal high school education, with specific focus on ocean literacy, blue economy, including aquaculture



Thank You.

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