UNIVERSITY OF DUBROVNIK

MARIBIC

Tehnološki i poslovno-inovacijski centar za marikulturu

Mariculture Business Innovation Center

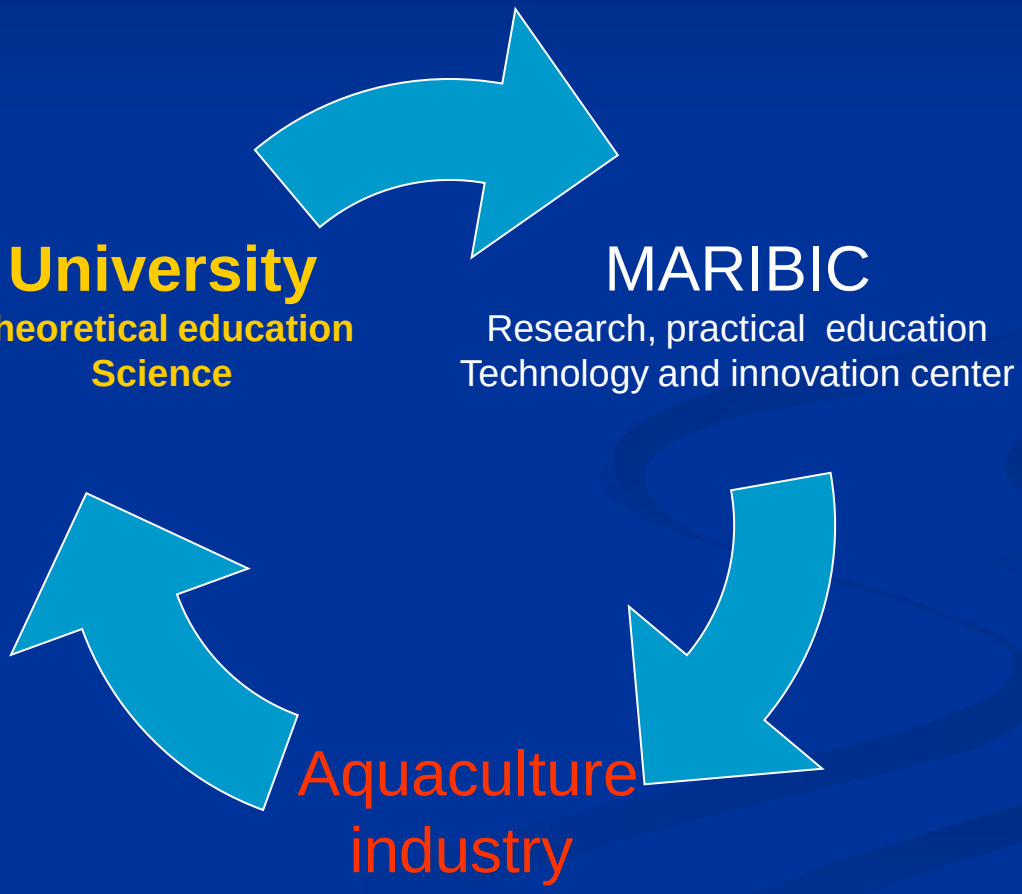
Why are we here?

- More than a half of Croatian shellfish production comes from the Bay of Mali Ston
- Tradition in the production and in the shellfish consumption
- Production of fish in floating cages
- Locations selected for aquaculture which require investment and technology transfer
- Study of Aquaculture on the University of Dubrovnik
- Good case for the Croatian aquaculture that needs consolidation and modernization

Botle neck in the development of Croatian aquaculture

- Lack of the seed stock in shellfish culture (particulary oysters and some other species interesting for aquaculture)
- Unavailable technology for spat production that would secure the expansion of the shellfish production
- Insufficient domestic production of fish fry
- Traditional technology in shellfish and fish production
- Lack of investment capital for the development of new technologies, modern marketing and providing support for enterpreneurs

Mission and the position of MARIBIC



MISSION

In this way, MARIBIC's mission is to fulfill a missing link between scientific/educational institutions and active and prospective aquaculture producers, taking a vital role in the advancement of practical education and student research, and in the support and development of the aquaculture industry.

With increasing energy costs and rising concerns over the environmental consequences of our energy policies, we embrace the awareness of the importance of resource ***sustainability.***

How was MARIBIC established?

- Technology center as a part of TEHCRO program of Croatian Business Innovation Center

- Total investment of 4.2 million euros:

  - 1.8 million € as a loan from the World Bank
    (70% as a grant, 30% loan with 3 years of grace period)

  - 2.4 million € secured through University of Dubrovnik and BICRO, by the Ministry of science, education and sports of the Republic of Croatia

Efficient and profitable approach

Traditional aquaculture methods cannot generate the quantities necessary to fill the gap between the increasing demand for fish and declining yields from the world's rivers, oceans, and seas. The aquaculture industry cannot expend to the levels nedeed to meet demand without an investment in more efficient technologies and management methods.

MARIBIC

- Research/education facilities
- Demonstration/production and facilities
- Technology and innovation center
- Business incubation center
- Aquaculture Information center

Demonstration and production facilities

- Vertically integrated finfish production system
- Shellfish hatchery, spat production and long lines for ongrowing
- Phyto and zooplankton production facilities
- Recirculation system for shrimp and fish production
- Distribution and purification center for shellfish
- Laboratories
- Equipment manufacturing

Aquaculture technologies

- Introduction and evaluation of new technologies and inventions
- Evaluation of new equipment for aquaculture
- Introduction of new fish and shellfish species
- Fish and shellfish hatchery technology
- Custom designed production and research systems
- Recirculation aquaculture systems

Vertical integration, birth to market size

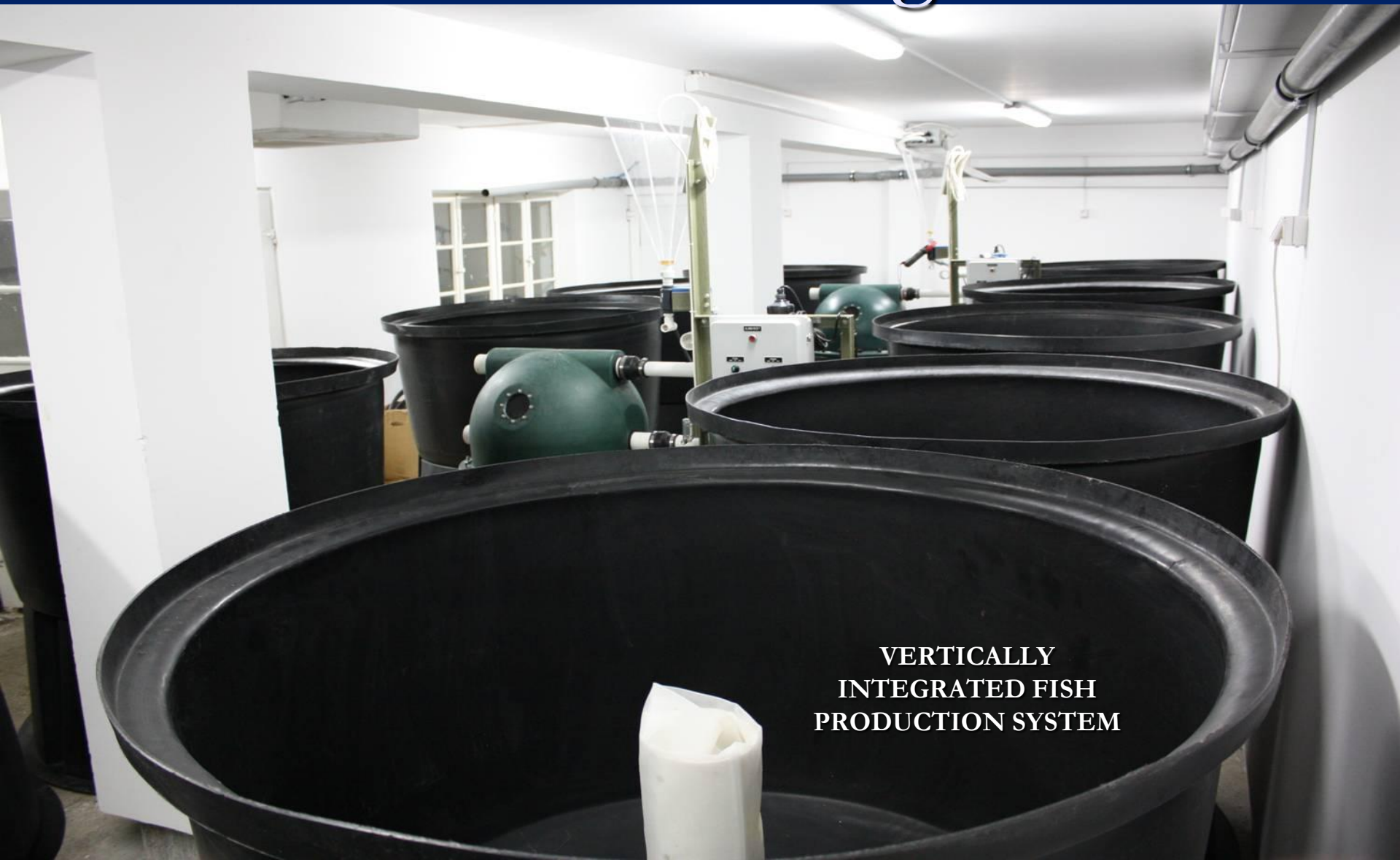
- Broodstock facility
- Hatchery
- Nursery Grow-out
- Waste mitigation facility

INTEGRATED SYSTEMS INCLUDE BROOD STOCK, HATCHERY, FRY, FINGERLING, AND GROWOUT CULTURE SYSTEMS. THESE PROVIDE FOR COMPLETE VERTICAL INTEGRATION, GREATLY INCREASING PROFITS AND REDUCING THE POTENTIAL FOR THE INTRODUCTION OF DISEASE.

Recirculation components for the broodstock conditioning facility

VERTICALLY
INTEGRATED FISH
PRODUCTION SYSTEM

Closed recirculating system for fish larval rearing



Production/research facility– nursery

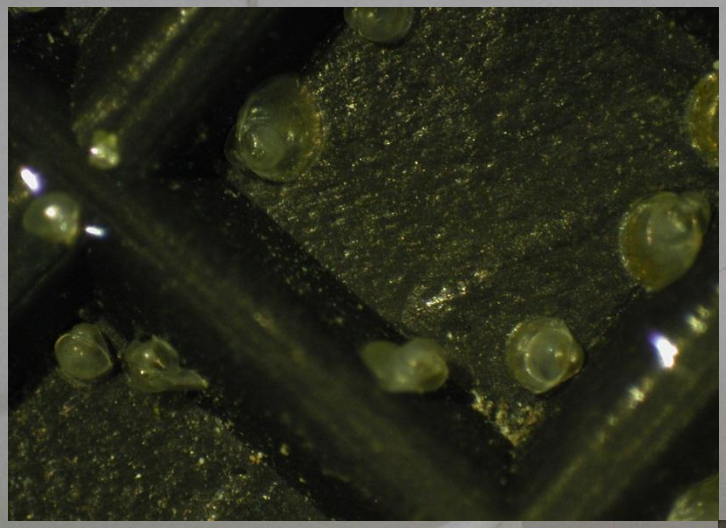
VERTICALLY INTEGRATED FISH PRODUCTION SYSTEM

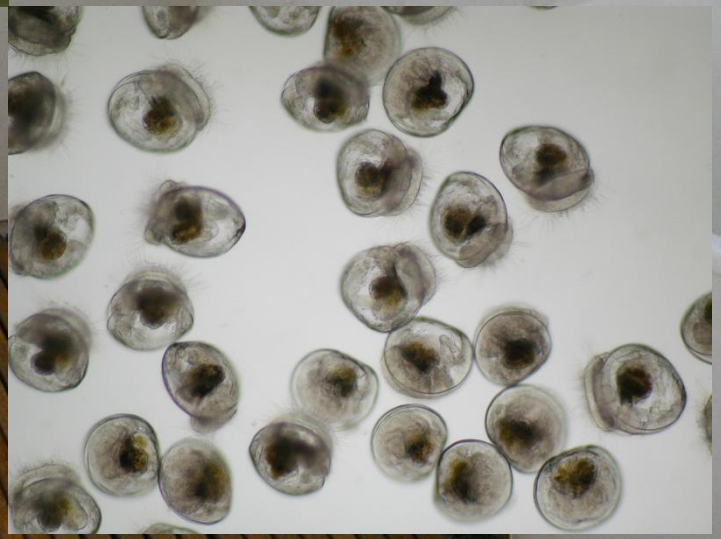
Cage culture – fish grow-out (an annual production of 100 metric tons)

Shellfish broodstock conditioning systems

Live food production

Shellfish hatchery





Long lines for oyster production
(an annual production of 1 million
pieces)

Equipment testing and production

- Aquaculture equipment
- Custom designed system
- Tanks and containers
- Testing and certification

Research projects

- Scientific projects with the University
- Research projects with the industry subjects
- Development projects with the local government

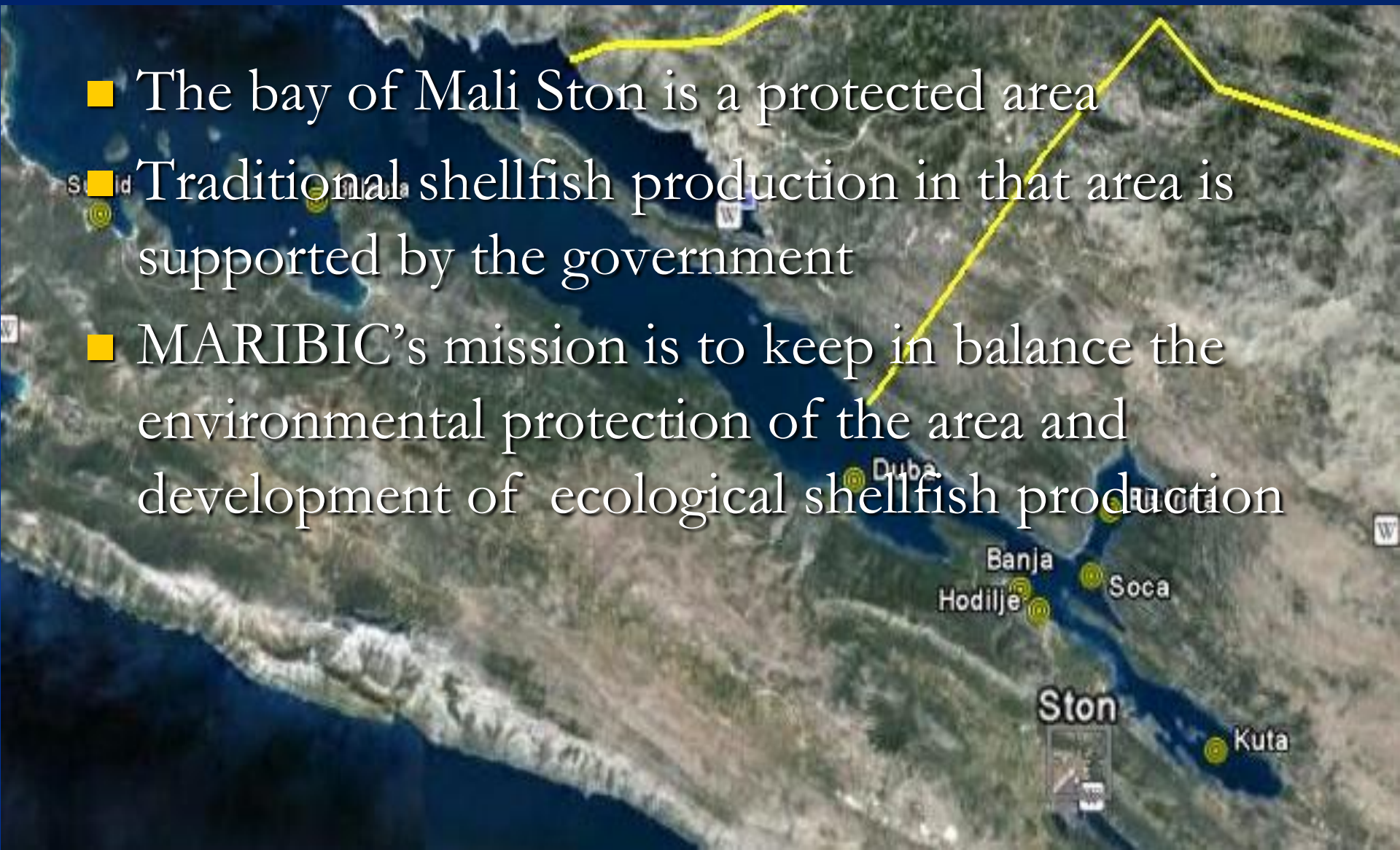
Education

- Participation in University studies and programs
- Programs in cooperation with the aquaculture industry, ministries and local government
- Training courses
- Workshops and seminars

Project management support

- Feasibility studies
- Contacts with investment institutions and banks
- Project management
- Start - up of the system and production
- Environmental studies and monitoring

Why are you here?



- The bay of Mali Ston is a protected area
- Traditional shellfish production in that area is supported by the government
- MARIBIC's mission is to keep in balance the environmental protection of the area and development of ecological shellfish production

How to achive that goal?

- Constant protection and monitoring of the aquatoria
- Monitoring of cultured population of shellfish
- Control of the activities in the coastal zone
- Education of producers and support of the ecological production

Design and construction of sustainable aquaculture systems

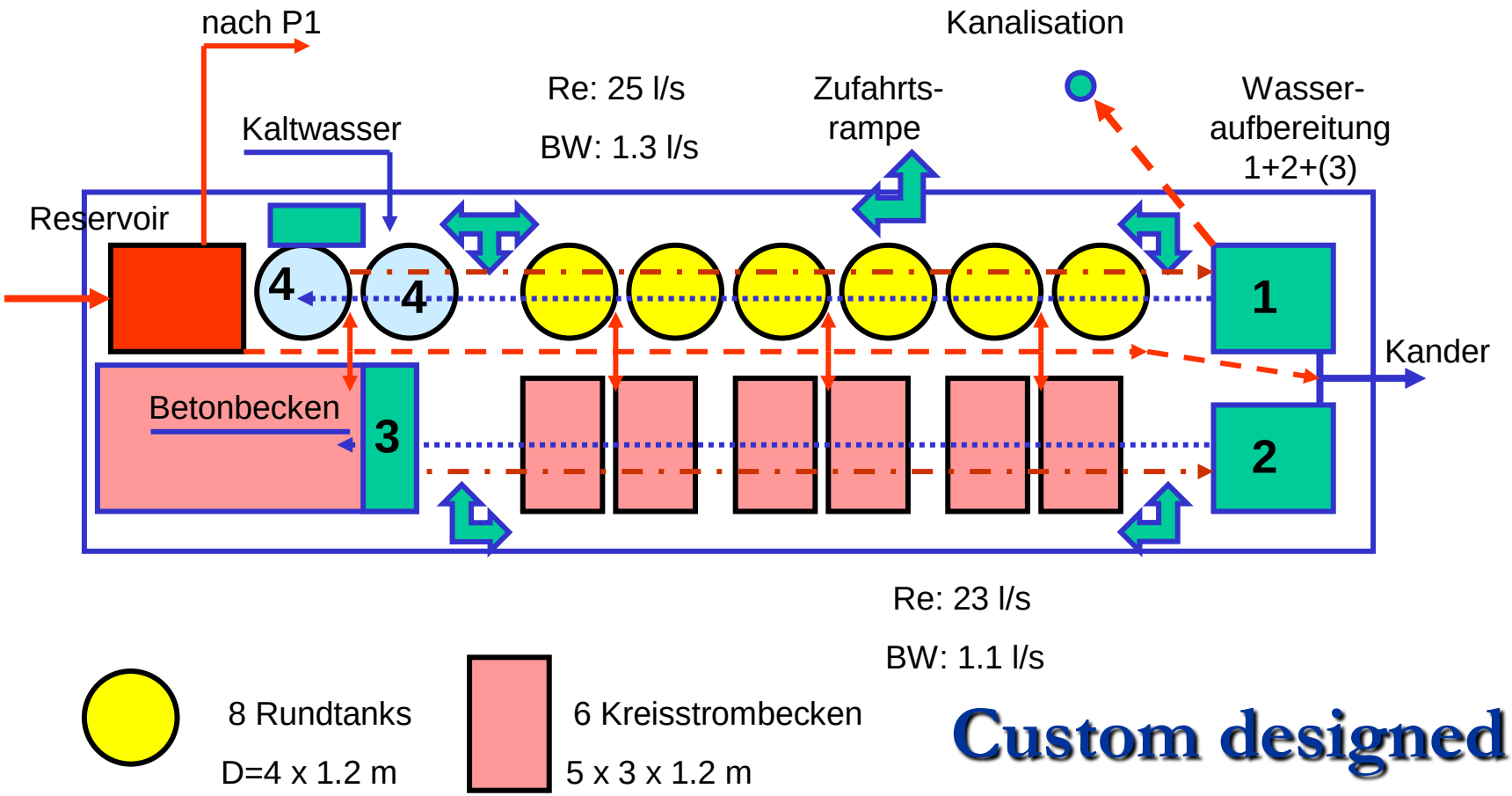
- Water conservation
- Waste water reduction and treatement
- Use of recirculation technologies
- Low energy systems

Small scale and medium size oyster hatchery – design parameters and financial feasibility study

Osnovni pokazatelji rentabilnosti

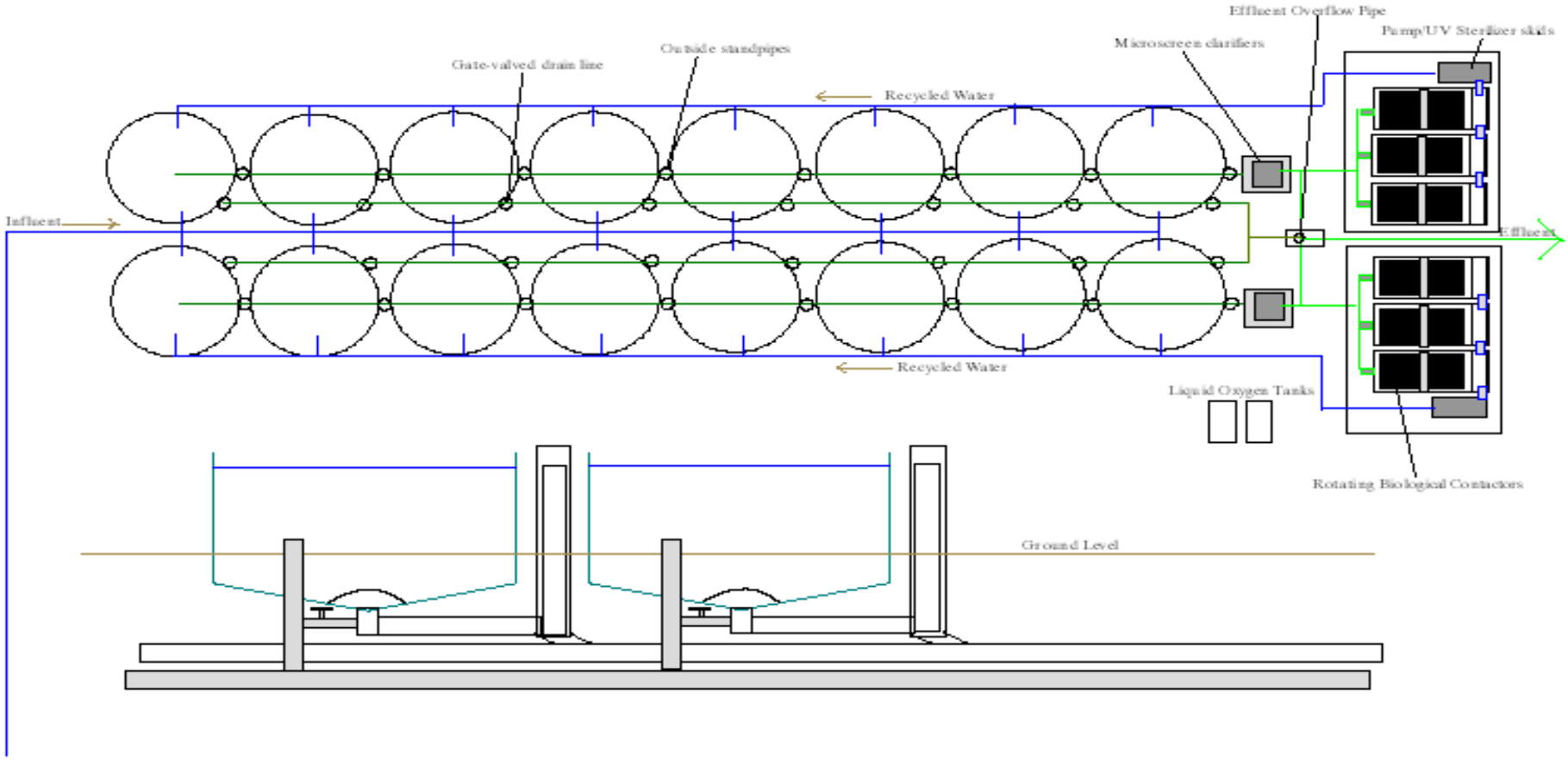
Investicija	990 000
Dioničarski kapital	100%
Zajam	0%
Interna stopa rentabilnosti	125%
Period povrata kapitala	2 godine
Godišnji prihod	1 120 000
Godišnji troškovi proizvodnje	347 000

Osnovni dizajn



Custom designed fish production system

Project- TROPENHAUS



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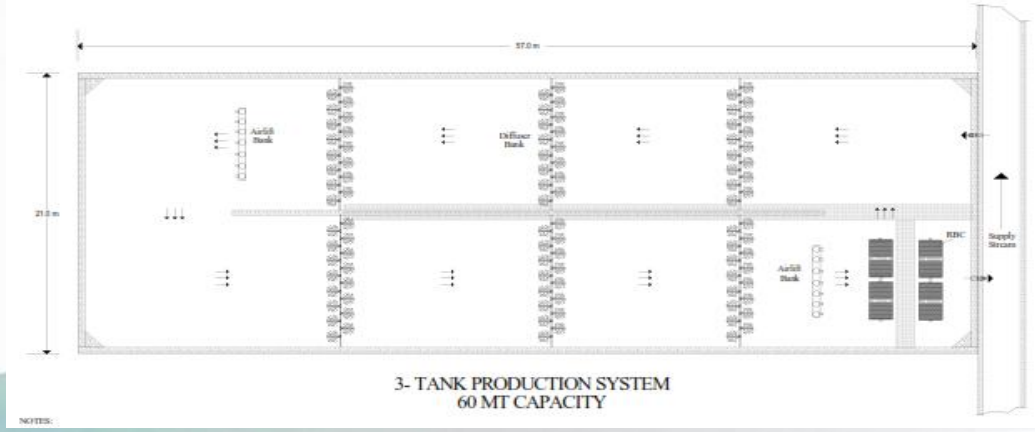
Design, technology solution and feasibility study for the abandand eel farm



Strategic partnership with investment and project development companies

Preliminary solution for 10-tank production system in Halle and technology transfer

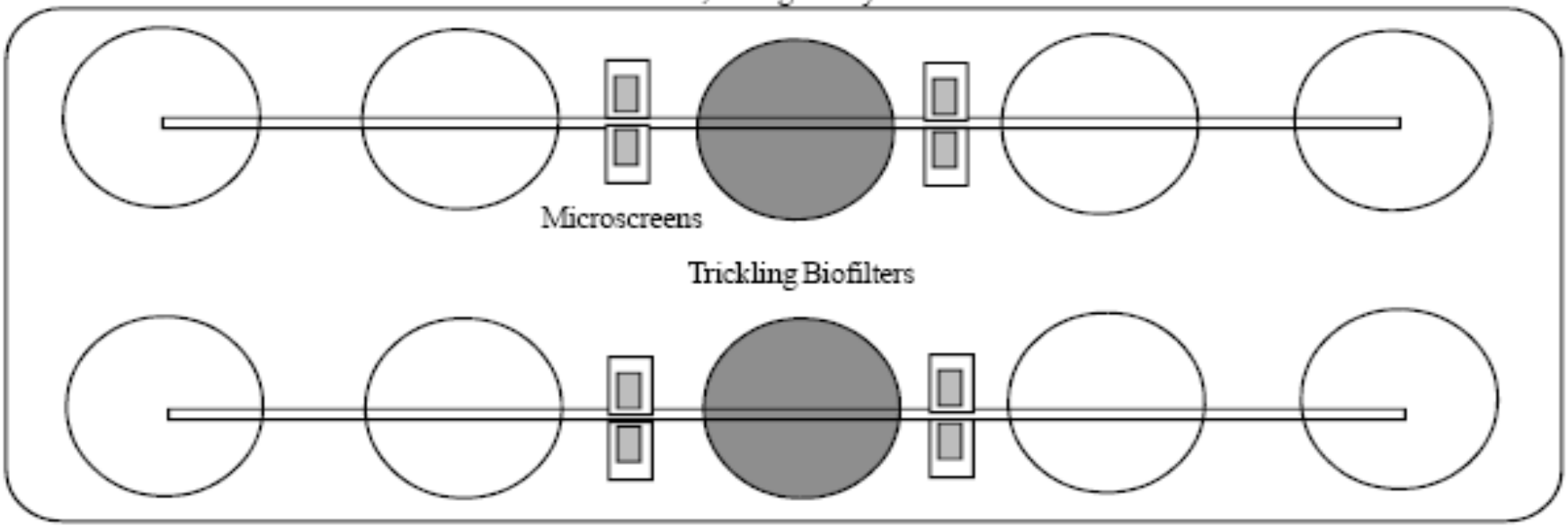
Considering salmon or bass harvested at 1,5 kg @ 50 kg/m^3

Taking 1 year to produce this size fish under optimal conditions (from 80 – 100 g fingerlings), each tank would produce 200 000 kg/year.

At harvest, feeding 4000 kg feed/day will require a trickling filter with approx. 125 000 m^2 of surface area.

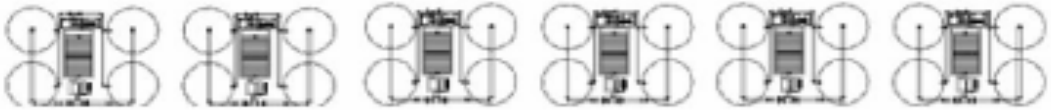
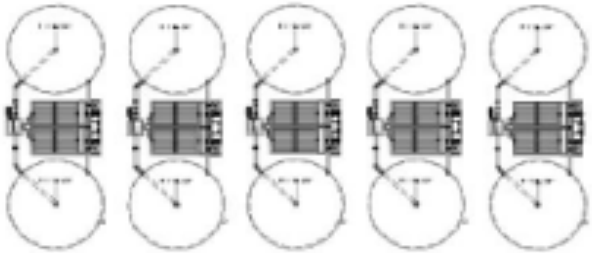
Appropriate media will provide 220 m^2/m^3, so each tank will require approximately 600 m^3 of media

GROW-OUT SYSTEM
230,000 kg/tank/year



NURSERY SYSTEM
170,000 fingerlings/tank/year (1.36 million total)

3 meter diameter tanks



7 meter diameter tanks