



**FARNET TRANSNATIONAL SEMINAR FOR FLAGS
WEIDEN, GERMANY 20 – 22 NOVEMBER 2017**
Integrating aquaculture within local communities

Duckweed for fish feed

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CONTEXT

- River water beneath a fish farm contains dissolved nutrients. Is there any means to trap them?
- Is it possible to grow feed ingredients in a fish farm?
- How could we get local protein ingredients instead of soybean?
- How could we make fish farming more cost-effective?



OBJECTIVES OF THE PROJECT

To promote

- The use of domestic feed ingredients in fish feed
- Environmental friendly fish farming
- Cost-effective fish farming

To test

- *Lemna minor* growing and harvesting techniques



PARTNERS

Fish farming Vääräniemi Ltd, Taivalkoski, Finland (premises, labour)

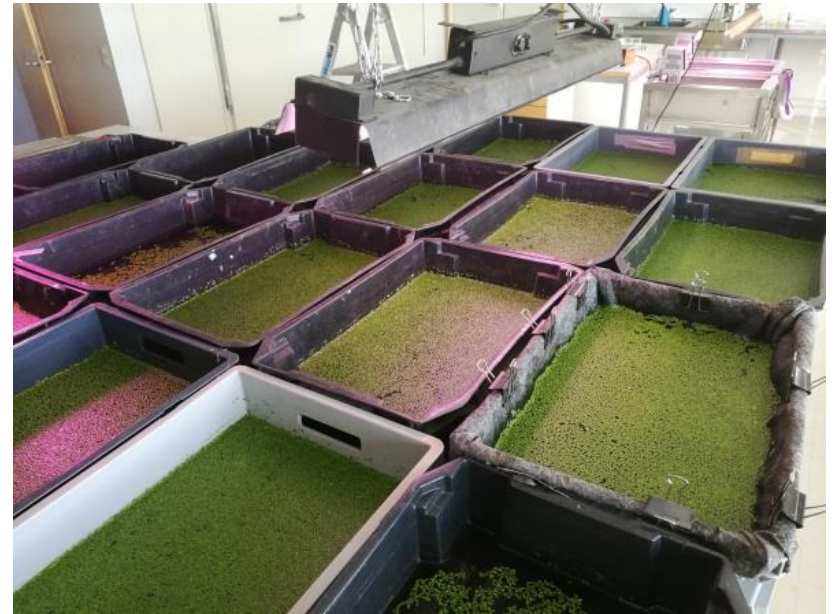
- Raisioagro Ltd (preparation of feed)
- FLAG Kainuu and Koillismaa (funding, expertise)
- Oulujärvi Leader LAG (funding)

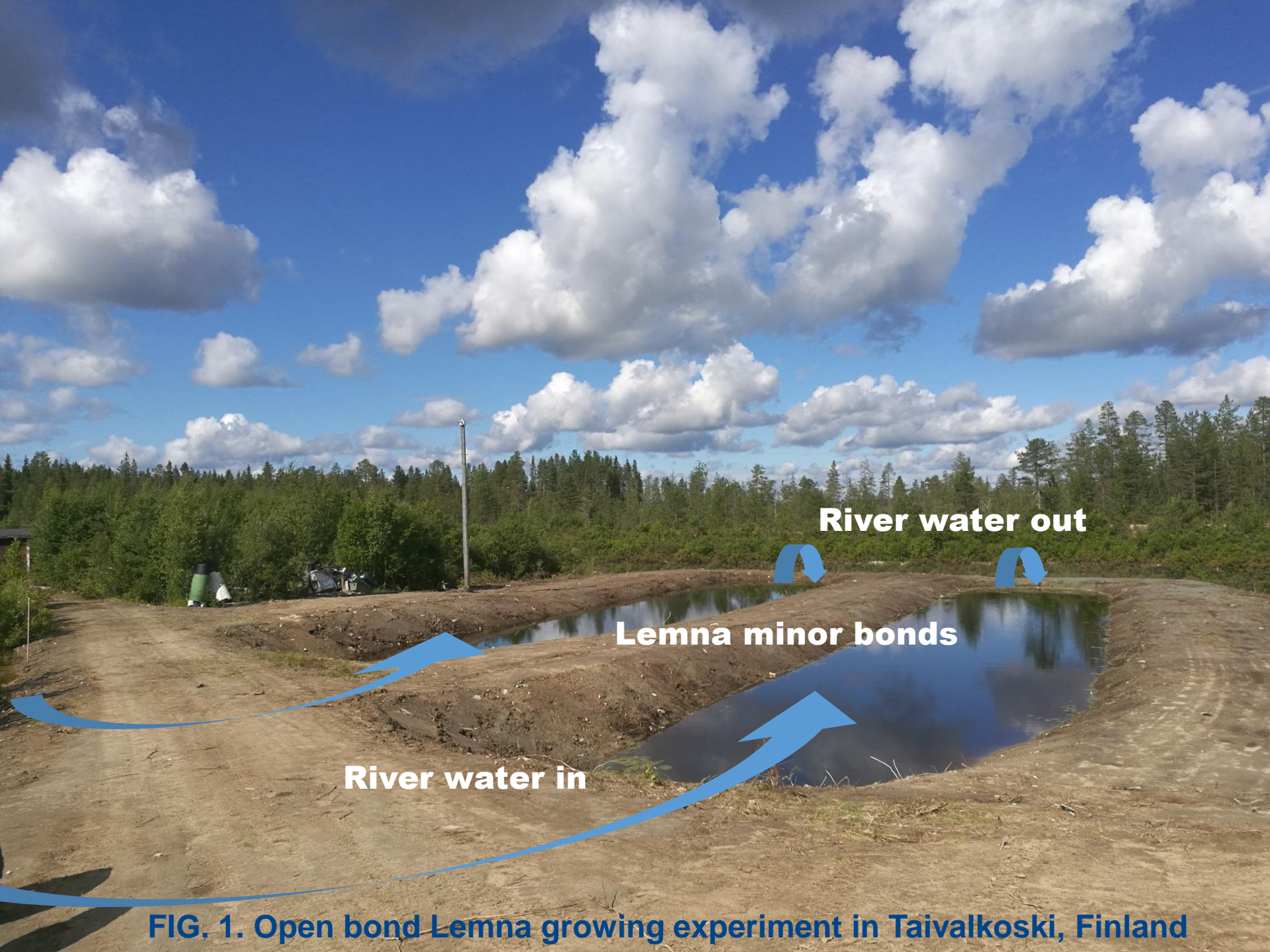


Field experiment in open ponds
River Oudonjoki, Taivalkoski, FINLAND
May 2017 - October 2018

METHODOLOGY

- Dissolved nutrients from fish farm water were trapped in *Lemna minor*
- Artificial bonds were constructed next to the fish farm for growing *Lemna minor*
- Wild, local *Lemna minor* populations were isolated and planted in bonds
- Lemnas were harvested manually by skimming with metallic net
- Biomass was air dried or frozen for analysis
- Small scale growing experiments were conducted in laboratory





River water out



Lemna minor bonds

River water in

FIG. 1. Open bond Lemna growing experiment in Taivalkoski, Finland

RESULTS

Expected outputs of the on-going project:

- Are northern climate conditions sufficient for large scale *Lemna* growing?
- Wild clones are isolated and characterized (Taivalkoski and Vuokatti clones)
- Experience in *Lemna* harvesting and drying techniques are gained
- Growing mediums are tested in laboratory
- Chemical analyses will next winter
- *Lemna* feed recipes will be tested next summer