

Report - study visit to Aland, Finland



Prepared on September 21, 2012



Study tour date

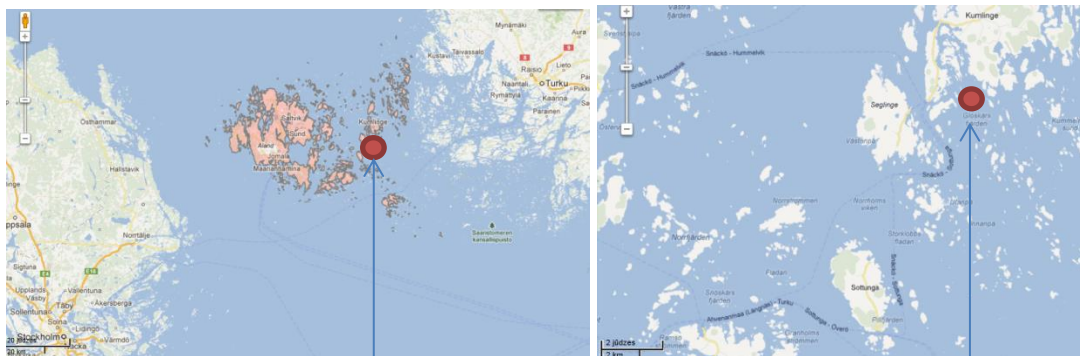
August 22-25, 2012

*Manager of mussel farm in Åland
Torbjorn Engman¹*



Introduction

The mussel farm is located in Gloskars fjarden, near Snacko and Kumlinge Islands. The farm is located approximately 70 km from Mariehamn port.



<http://maps.google.com>

The farm was established by Torbjörn Engman with the help of the Provincial Government of Åland and the European Union. T. Engman is a fisherman and he planned to retire, but when he heard about the mussels and that they are cleaning the Baltic, he wanted to try it.²

¹ http://www.nyan.aland.fi/kultur_noje/recensioner.pbs?news_id=43721

² http://yle.fi/uutiset/mussels_enlisted_in_effort_to_clean_baltic_sea/5605505



This farm has been established for researching not for business. Due to this reason part of information collected in the farm will not be used for commercial purpose.

The mussel farm was established in 2005 and in 2008 they harvested 4 tons of mussels. The farm was established to prove that the mussels were growing in Baltics.

The mussels were sent to laboratory to study its parameters. According to the data, none of the parameters were critical and they all were much under critical. By this they proved that in the Baltic Sea mussels are not harmful for human.

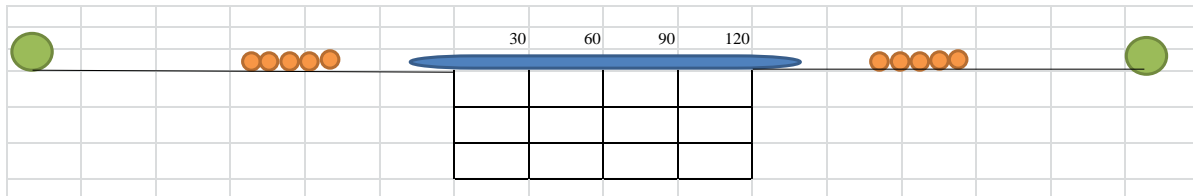
In 2010 Aland Government chose to set a bigger farm. The expert from SMART FARM set a farm within couple of days. In June 2010 they set the farm using SMART FARM (Norway) equipment.



The mussel farm should be ready before settling of mussel because the larvae of the blue one settle in early summer on vertical suspenders attached to horizontal long-lines carried up by buoys.³

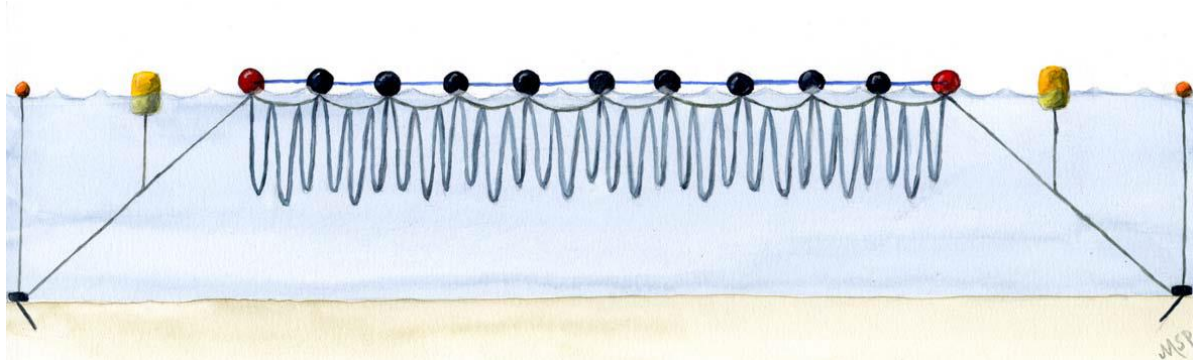
³ <http://www.coonamesettfarm.com/sitebuildercontent/sitebuilderfiles/shellfish-importance.pdf>

Visualisation of farm



The farm is secured by anchors. As it was impossible to see under the water, the location of anchors might be in the same positions as in Lindhal's created picture.

Probable visualisation⁴



On the top of water it is possible to see buoys and nets. The anchors allow securing nets. If the nets are not fixed enough, the farm might flow away or even be destroyed.

Size of farm

- 4 lines
- Length – 120 m
- Depth 8 meters

In this case the size of the farm was been set to understand if mussels set on nets. The size of the farm might be bigger.

⁴ <http://www.zin.ru/conferences/Periphyton2008/pdf/lindahl.pdf>



Legislation

According to the legislation of Finland, the fishing rights have been transferred to the person who belongs to a place. It means that the rights in these fishing places are for definite fishermen, thus only these persons can fish there.

In this case, this fisherman receives the payments for using the water from the government of the Åland.

Method of mussel growing

In the farm, the mussels are growing on **nets** (on the ropes). The net has been attached by plastic pipes. See *Smartfarm* (www.smartfarm.com).

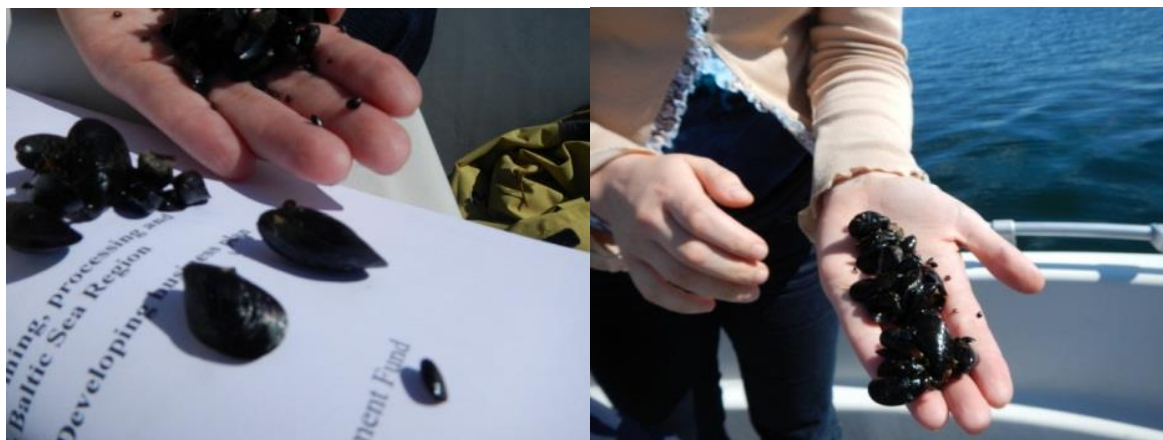


They established the farm in June and in September 2010 they checked nets which were full of small mussels.

Size of mussels

The size of mussels depends on its age and salinity of water. In saltier water, the mussels are larger. Due to this reason, the mussels in the Baltic Sea might reach up to 10 cm compared with the mussels in the North Sea – 20cm.⁵

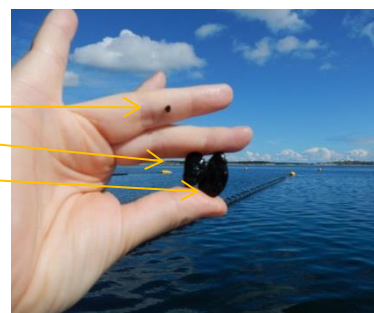
⁵ Latvian Institute of Aquatic ecology,
http://www.kurzemesregions.lv/projekti/Centrala_Baltijas_juras_regiona_parrobezu_sadarbibas_programma/Gliemju_kommerciala_audzesana_parstrade_un_izmantosana_Baltijas_juras_regiona



The mussel size in the Aland

- Within the first months the mussels were 2 mm;
- After 1 year and 2 months the mussels were ~2 cm;
- After 2 year and 2 months the mussels were ~3 cm.

The average size of mussels is 1-2.5 cm.



Harvesting

In November 2012 the Smart Farm is going to harvest mussels. The manager of the farm plans to harvest approx. 40-50 tons of mussels.

The whole harvesting process will be done by using the Smart Farm equipment.

Risks

Since the establishing of the farm, the farmers successfully overcame storms and ice break. Near this farm there was also an empty trout farm that was devastated by this storm and ice breaks, but the mussel farm survived exhibiting minor inconveniences.

Ice⁶Damaged farm⁷

The nets are inspected once a year.

The scientists from Finland inspected the farm to find out some information whether the farm effects the environment near the farm. According to the research under the farm (See WP4 report part 2), the mussel effect increase the transparence in the water and the biodiversity of animals at this scale.

Fishes⁸

⁶ <http://www.flickr.com/photos/nielsleeninga/6784688701/>

⁷ <http://www.stuff.co.nz/marlborough-express/news/4773798/Tsunami-mauls-mussel-farms>

⁸ <http://www.consilium.europa.eu/homepage/showfocus?lang=en&focusID=67042>



Financial parameters

Incomes:

- 45 tons;
- Actual price is unknown yet (3 EUR).

Costs:

- 1 fisherman, part time employed (monthly);
- Fuel (monthly)
- Diving services (yearly)
- Administrative costs (monthly)

Equipment

- Nets
- Anchors
- Plastic pipes
- Boat

Investment amount 84 T EUR.

The services length of the equipment is about 10-20 years. The use of metallic equipment might be shorter as the salinity influences the metal (corrosion), but he pipes might be used for 20 years.

For harvesting it is necessary to have a crane, a refrigerator and a ship.

Calculation

		Y0	Y1	Y2	Y3	Y4
price				3		3
amount				45000		45000
Income, EUR				135000		135000
Cost		23144	36104	33512	38696	36104
Months		7	12	11	13	12
Salary	2000	14000	24000	22000	26000	24000
Tax	24%	3360	5760	5280	6240	5760
Fuel	80					
	1,4	784	1344	1232	1456	1344
Administrative		5000	5000	5000	5000	5000
CF		-23 144	-36 104	101 488	-38 696	98 896
Investment amount		84000	0	0	0	0
Support, 75%		63000				
CF		-44 144	-36 104	101 488	-38 696	98 896
IRR				16%		34%
NPV				-2 029		15 470

IRR – internal rate of investment

The internal rate of return (IRR) or economic rate of return (ERR) is a rate of return used in capital budgeting to measure and compare the profitability of investments. It is also called the discounted cash flow rate of return (DCFRR) or the rate of return (ROR). In the context of savings and loans the IRR is also called the effective interest rate.⁹

⁹ http://en.wikipedia.org/wiki/Internal_rate_of_return



IRR - with support 75% - **16%** (3 years) or **34%** calculated for 5 years.

NPV – net present value

*A measure of discounted cash inflow to present cash outflow to determine whether a prospective investment will be profitable.*¹⁰

NPV is negative, if it is calculated for 3 years or 15 T EUR for 5 years.

Conclusion

The first –Establish the pilot farm in your country

It will provide you with the information on:

- Mussel places in the region;
- Information of mussel chemical conditions, e.g. whether the mussels are useful for human consumption
- Possibility to use different methods to understand which one is the best for your region
- Risk factors, e.g. might your farm successfully survive during ice, storms and strong wind seasons etc.
- What kind of enemies might influence your farm, like sea birds, fishes, cormorants etc.?

Size of mussels

Before the study tour we got different information about the size of Baltic mussel. Visiting the farm we got a precise information on its size within 2 years. Their size was 2-3 cm.

Settling time

The mussels settle in the beginning of summer. If the farmer can't establish the farm by this period, the year might be considered as lost.

¹⁰ <http://financial-dictionary.thefreedictionary.com/NPV>



Amount per m2

During this study tour we didn't get the potential amount of the mussel grown within one square meter. The main problem is that that farm was not prepared as enterprise.

Not answered!

During next study tour we need to calculate the amount based on salinity in the North Sea and extrapolate these data based on salinity in the Baltic Sea.

Legislation

In Finland the fishing rights have been delivered for fishermen. So the fisherman might choose the type of fishing, fishing gear and fishing methods.