



Project no. **COOP-CT-2004-513049**

Project acronym: **MusselHarvest**

Project title: *Development of a cost effective technique for mussel harvesting combined with product control and retubing*

Instrument: **Co-operative Research Project**

Thematic Priority

Publishable Final Activity Report

Date of issue of this report: June 2007

Start date of project: 1st November 2004

Duration: 30 months

Organisation name of lead contractor for this deliverable: Teknologisk Institutt AS

Revision: 0

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1 Project Objectives and Partnership

The overall objective of the MusselHarvest project was to develop a cost effective, fully integrated mussel harvester specialized for the harvesting, grading and retubing of mussels from longline systems.

To meet this overall objective several technological objectives for the project were set out, including:

- The development of two different devices; one that, in conjunction with a retubing machine, mechanically/automatically attached securely the retubed mussel sock to the longline backbone; and another device that mechanically/automatically detached the mussel dropper from the longline backbone prior to the stripping of mussels from the dropper
- The development of a cost-efficient stripper with the ability to minimize mussel damage
- The development of a grader capable of sorting the mussels with respect to size, weight, and food content
- A starwheel hauler that has the ability to drag the harvesting vessel along the longline
- A Hydraulic Power pack for the system with an integrated control system

Additionally, the project set as a goal that the harvesting system should have the ability to harvest a variety of types of rig systems consisting of single or double longlines.

SME CONTRACTORS:

- 1 Hemnes Mekaniske Verksted AS, Norway
- 2 Niebling Technische Bürsten GmbH, Germany
- 3 Hydro-Naval S.J., Poland
- 4 Sandnessjøen Engineering AS, Norway
- 5 Topglass SPA, Italy
- 6 Follaskjell AS, Norway
- 7 Norðurskel ehf, Iceland

OTHER ENTERPRISE/ENE USER CONTRACTORS:

- 8 Marel hf, Iceland

RTD PERFORMER CONTRACTORS:

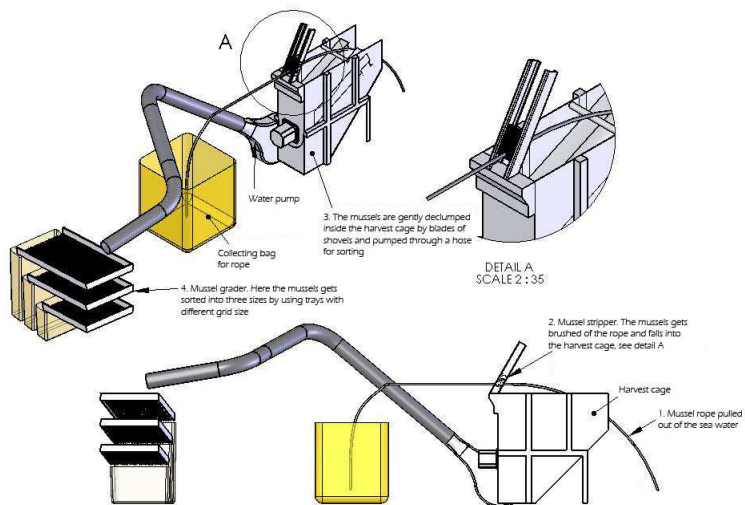
- 9 National Institute of Technology, Norway
- 10 Product Engineering Research Association (PERA), UK

2 Results

The main achievement of the project is novel prototypes for mussel harvesting and attachments of mussel collectors/mussels socks to longline, built by the SME partners Hemnes Mekaniske Verksted AS, Follaskjell AS, Sandnessjøen Engineering and Hydro Naval and tested under real life conditions. Furthermore, a mussel grader has been developed and ready to be coupled on the complete mussel harvesting line. Despite that the system has showed promising test results, it needs further refining and development to tackle different mussel collector configuration.



Mechanized system for attachment of mussel collectors and retubed mussel socks to longline, with integrated automatic sinker release unit.



Sketch of mussel harvesting system



Prototype mussel grader with exchangeable trays

The consortium behind the project has gained important knowledge within the automatic grading of mussels with respect to size, weight, and meat content. An ultrasonic apparatus to grade the mussels was tested and rendered unfit to this specific purpose due to maturity of technology and overall costs. Preliminary tests of X-ray technology performed at PERA Innovation UK showed more promising results. The lessons learned from these investigations will form an important basis for everyone that should wish to venture further into the field of automatic mussel grading.

3 Dissemination and use

3.1 *Exploitable knowledge and its use*

Exploitable Knowledge	Exploitable Product(s) or Measure(s)	Sector(s) of Application	Timetable for Commercial Use	Patents or Other IPR protection	Owner and Other Partners Involved
A: Increased efficiency for putting out mussel seed collectors and mussel socks	Attachment system	Mussel farming industry & harvesting eq. manufacturer sector	Second half 2007 and forward	Secrecy	Sandnessjøen Engineering, Hydro Naval, Hemnes Mek.
B: Automatic sinker release system for holding the collectors in vertical position in water column	Sinker release system	Mussel farming industry & eq. manufacturer sector	Second half 2007 and forward	Secrecy	Sandnessjøen Engineering, TI
C: Efficient and improved system for Mussel grading during harvesting process	Mussel grader	Mussel farming / harvesting sector	Second half 2007 and forward	Secrecy	Hemnes Mek., Follaskjell
D: Increased efficiency for harvesting mussels on longline system	Harvesting system	Mussel farming/ Harvesting Sector	2006 and forward	Secrecy	Hemnes Mek., Follaskjell

3.2 *Dissemination of knowledge*

Planned/actual dates	Type	Type of audience	Countries Addressed	Size of Audience	Partner responsible / involved
May 2006	Poster and info brochures at Aqua 2006 Exhibition, Florence, ITA.	Delegates in the marine sectors from all over the world	Worldwide	> 3.000	TI, NTB
April 2006	Poster and brochures at Norway Fish & Aqua 2006	Fish & Aquaculture Industry, research, governmental	Worldwide	7.251	TI
March 2006	Poster and handouts at National Mussel Conference 2006	Industry, research, governmental	Norway	160	TI, HMT
December, 2005	Poster and info brochures at TEKMAR conference 2005	Industry, research	Norway	100	TI
August, 2005	Poster and info brochures at AquaNor 2005 Exhibition.	Delegates in the marine sectors from all over the world	Worldwide	> 15.000	TI, HMT, SE, NTB
March, 2005	Distribution of info in paper to delegates on the national mussel conference.	Industry, research, governmental	Norway	200	TI
March, 2005	Plant tour & discussion with the manager of	Industry	Norway	6	TI

	NSP, Forsand Norway (mussel packaging plant)				
February, 2005	Presentation of project for several people in the Icelandic mussel farming industry on individual basis	Industry	Iceland	8	TI

Through the dissemination activities which have been performed during the course of this project, the consortium has reached a potential audience of over 25.500, not counting visitors to the project web-page.

3.3 Publishable results

The project idea of Mussel Harvest project has been to develop a cost effective technique for mussel harvesting combined with product control and retubing.

As current mussel farming methods are much based on manually handling and labour intensive processes, the Mussel Harvest system is intended as more automatically driven and hence more cost effective. In addition, the Mussel Harvest system is intended to compete with today's technologies with respect to both flexibility and health/safety issue.

During the project period, the consortium produced two separate pilot systems which was used for two different functional tests; one for putting out mussel seed collectors and socks and the other for mussel harvesting and grading.