

SUSTAINABLE FOOD PRODUCTION AS  
PART OF OUTER DENMARK TOURISM

AN OYSTER FARM BY LIMFJORDEN

CHRISTINE BIHLET PEDERSEN  
THESIS PROGRAM



Studnet No: 150290  
Tutor: Scarlett Hessain  
MA Architecture Spatial Design  
Head of Programme: Peter Thule Kristensen  
KADK spring 2021



Photo 1. Limfjorden, Gjøl, 2020

## CONTENTS

|          |  |           |
|----------|--|-----------|
| <b>1</b> | <b>INTRODUCTION</b>                                      | <b>4</b>  |
| <b>2</b> | <b>PROJECT STATEMENT</b>                                 | <b>6</b>  |
|          | WHY OYSTERS?   | 6         |
|          | HOW OYSTERS CAN MAKE LIMFJORDEN HOME FOR GASTRO-TOURISTS | 8         |
|          | RESEARCH QUESTION  | 11        |
| <b>3</b> | <b>CONTEXT</b>   | <b>12</b> |
|          | WHY LIMFJORDEN HAS THE WORLD'S BEST OYSTERS              | 12        |
|          | GJØL - HOME OF FISHERMEN, THE NEW STORY                  | 14        |
| <b>4</b> | <b>PROJECT FRAMING</b>                                   | <b>18</b> |
|          | WHO ARE GOING TO VISIT?                                  | 18        |
|          | HOW WILL WE PRODUCE?                                     | 20        |
|          | WHAT TO BUILD?   | 20        |
|          | BUILDING WITH SHELLS                                     | 22        |
|          | UN SUSTAINABLE DEVELOPMENT GOALS                         | 24        |
| <b>5</b> | <b>METHODS AND TECHNIQUES</b>                            | <b>26</b> |
|          | RESEARCH & DESIGN  | 26        |
| <b>6</b> | <b>FORMALITIES</b>                                       | <b>28</b> |
|          | DELIVERABLES   | 28        |
|          | PRESENTATION PLAN  | 30        |
|          | TIMETABLE  | 32        |
| <b>7</b> | <b>BIBLIOGRAPHY</b>                                      | <b>34</b> |

Looking back in history, oysters and shellfish has always been part of the danish food tradition. Today we might mostly know the food as an element for finer dining, but archaeological find shows that even back in the stone age the nutritious shell was an important part of the diet. Over the past years the government has decided to support production of oyster farming to ensure a sustainable and beneficial harvest in the danish waters (Udenrigsministeriet, 2019). The nutritious clam is not only good for the diet but also has a very positive influence on the environment, and therefore has a potential for growth to ensure a more sustainable food production in the future.

Growing up on the small peninsula Gjøl by Limfjorden, I see how the fjord is a very big part of the local's identity. The history of the fishermen from the area providing the whole area with fish, is something the locals would proudly tell about. Actually, the famous book by Hans Kirk; *The fishermen*, from 1928 is written at this exact place which is rooted deep into the locals this day today still. Unfortunately, a lot of these smaller communities has lost its origin purpose and identity and struggle to attract people to come see the area. I therefore intend to combine the focus of production of sustainable local rooted food with a focus on promoting the area for tourists to help frame the area's unique and rich nature and to show and share knowledge on how to put the oyster back on the dining table for everyone.



Photo 2. From the film adaptation of *The Fishermen* in 1977.  
The fishermen on Limfjorden.

## PROJECT STATEMENT

## WHY OYSTERS?

Nord-Ostron is an innovation project within EU's Interreg program that ran from 2007 - 2013 to strengthen the Scandinavian collaboration within research and business community of the marine sector with a special focus on increased production and breeding of oysters. The program aims to promote knowledge about this sustainable food that is also shown resourceful in improvement of water conditions because of its filtering properties and therefore has a positive environmental effect. (Gøteborg Universitet, 2012). The project is still used as a leading statement for the development within this field.

To ensure a growing market Nord-Ostron made a list of building stones to aim for during the process. Among them we find:

- Increased focus on research and development operation, including the field of hatching and breeding.
- Focus on the domestic market through sale on a local plan as a starting point.
- Increased focus on interest and knowledge about oysters, for example events that focus on the food experience / food culture within the field of oysters.

My project will develop through these three main statements as a frame for the project of creating an oyster farm to set focus on local production as part of outlying denmark tourism.



Photo 3. Oyster picking in Limfjorden.

## HOW OYSTERS CAN MAKE LIMFJORDEN HOME FOR GASTROTOURISTS

In 2018, a group of smaller cities along Limfjorden created the movement “Enjoy Limfjorden”. The goal is to make shellfish the fundament for an increased tourist number in the area with focus on the rich food experiences and the unique nature. The movement speak into a trend of increased interest in gastronomical experiences and a general interest in a sustainable food market. My project aims to create the frames for being part of this movement. I intend to create a setting where people can come learn and take part of the farming as well as try how to cook and serve oysters in various ways. The goal is to share knowledge and educate about how the oyster can be a bigger part of our everyday diet. Overall I intend to create a space that people visit on their trip to the area of Limfjorden for a day of experiments, togetherness and a rich nature experience.



Photo 4. Limfjordsoysters served as a nugget, By Venø Fish Farm.  
Photo 5. Limfjordsoyster served raw.

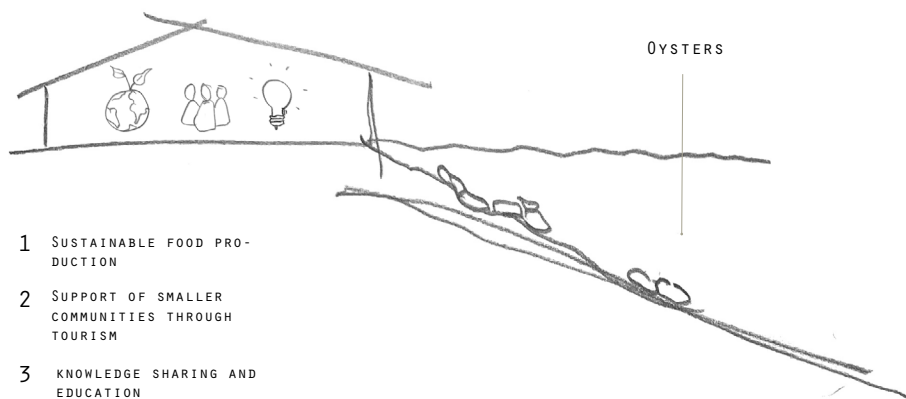


Figure 1. Concept drawing.

#### RESEARCH QUESTION

**How can an oyster farm create the settings of an increased focus of the oyster as a sustainable food and help create more tourism in the area of Limfjorden?**

## CONTEXT

LIMFJORDEN, NORDJYLLAND, DENMARK



Figure 2. Location of the Oyster farm in Limfjorden



Figure 3..Location of Oyster farm in Denmark

## WHY LIMFJORDEN HAS THE WORLD'S BEST OYSTERS

When people think of oyster picking in Denmark, they probably picture the Wadden Sea by the west coast of Jylland. What you find here is the Mediterranean Oyster which is invasive and therefore has taken over the area. In Limfjorden the water conditions are different and therefore has very favourable conditions for what many people call the World's Best Oyster (Hansen, Honest Cooking) – The European Oyster, also called Limfjords Oyster since its only found here. Because of the cold climate in Denmark the oyster has slow growth conditions and therefore ensure a more concentrated flavour, that is described as very salty and more firm than most other oysters. The potential of this oyster to replace some of our meat consumption is therefore relevant to take into consideration. No matter what, the oyster's potential for being a bigger part of our diet, is yet unredeemed and seem like a good fundament for creating bigger focus on local produced sustainable food sources.

## GJØL

HOME OF FISHERMEN - THE NEW STORY

In the north of Jylland, on the northern side of Limfjorden, a small village called Gjøl is quietly located. Among forest and inlet, sunflower fields and wheat fields, bird sanctuary and Apiary, a small oyster farm is spotted in the meeting between them all. Facing the early winter sun, reflected in the waves, gentle hitting small boats tipping from side to side. The scent of salt and seaweed is slowly passing the nose and remind you of the life lived here, by the inlet, as it has always been for the fishermen. The sound of class clinking is met with birds chirping in the back and followed of laughter in the distance. As getting closer to the farm, a scent of grill and a light smoke spreads and melt with the salty water hanging in the air. The cool air is tucking the cheeks gently and is felt all the way down the lungs. Inside, a small fireplace is lit up, and the nicely set table appears around the corner. Bottles of wine, candles and various settings of oysters appear on the table. People are gathering to enjoy the effort they have put them self through during the day on the water and in the kitchen. The heat spreads through the body and the sound of the fireplace crackling in the background melt with the scent of the wine and food. The oyster is now served.





# GJØL

HOME OF FISHERMEN - THE NEW STORY



Figure. Map of Gjøl, 1:20.000

## PROJECT FRAMING

## WHO ARE GOING TO VISIT?

The project intends to create facilities addressed to both the tourists interested in the gastronomical world as well as the farming and production of sustainable food, whether from Denmark or around the world, but also to the more professionals or school classes wanting to learn more about the oyster and its potential. The place intend to be the place you go to; to learn and experiment with the oyster as part of the dinner table. You come here to cook, eat and gather with other people. You come here to have a rich day of a nature authentic experience. You come here to have a nice day of impressions whether on the water picking oysters or in the kitchen cooking with friends for a shared dinner.

## VISITORS



## THE GASTRO TOURIST

The tourist interested in gastronomy and food in general is coming to the farm to experience the origin of the oyster and get more knowledge on cooking with oysters.



## THE CHEFF

Since the Limfjordsøyster is among the best in the world, it is a preferred oyster at many finer restaurants. Chefs could come to the farm to experience where it has grown to tell the authentic story at the restaurant.



## THE FAMILY TRIP

Families come visit to the farm to do something together that fit almost all ages. Going into the water picking them together, whereafter having a calm cooking session together inside in the heat by the fireplace.



## SCHOOL CLASSES

As part of the education program, the farm could occasionally invite in school classes to teach about the interesting life of the oyster and learn them to pick themselves.



## THE NATURE ENTHUSIAST

Since the area is already known among bird enthusiasts because of its sanctuary, they would come by the farm to have an oyster lunch as part of their weekend trip to the area.

## HOW WILL WE PRODUCE?

The oyster farm as a production unite is a quite new phenomena in Denmark. Since the oysters live free in the waters its more about setting out the right facilities to collect the oysters. This can be done by simply walking out picking them up by hand, but for bigger harvests, a boat, divers and special-made trays for the purpose is needed. However, there is a need of breeding more oysters to ensure a future growing population and a possible development of the whole production. This will not be a part of my actually design proposal but is considered part of a growth potential for my program and therefore taken into the phase of infrastructure.

## WHAT TO BUILD?

My design will focus on the facilities in where the guest come visit the farm. This will most likely include entrance, changing room, cooking / eating facilities, auditorium, restaurant, outdoor facilities for access to boats or / and bridges connecting to the oyster picking, and places to clean, prepare and pack oysters.

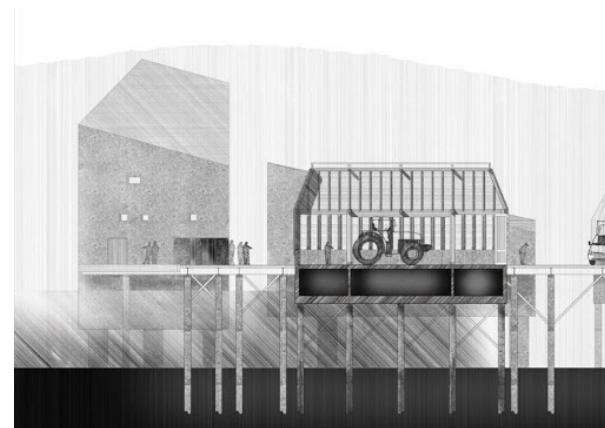


Photo 6. Oyster Farm by Sean Gualé, 2010, UK

## BUILDING WITH SHELLS

Building with shells is not a new concept, however it is not so very common. Back in the 16th century in Florida, a coastal building material made of lime, sand, oyster shell and water appeared. This product is called Tabby and has been used as an alternative for concrete all over the world in areas with a high density and access to oysters (Sheehan & Sickels-Taves, 2002). An example of recycled oyster shells as part of being a building material is seen in the newly won competition project by Jessica Spresser (SPRESSER) and Peter Besley of the Sydney pier pavilion. Here the oyster material is used for a huge amount of columns creating the main principal of the building. In my project I intend to experiment with production of a material made of recycled oyster shells as a significant part of my design proposal. In collaboration with Venø fish farm I will set focus on how recycled oyster shells can be part of creating sustainable building materials for the future.

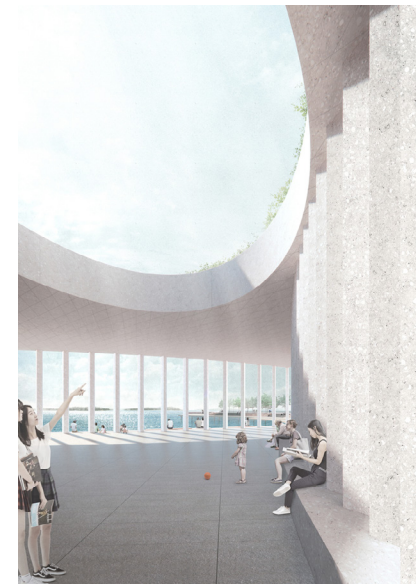


Photo 7. Sydney Harbour Pavilion made of recycled oyster shells, by SPRESSER and Peter Besley, Australia

## UN SUSTAINABLE DEVELOPMENT GOALS

Through my project I will work actively with the UN sustainable development goals. I intend to go into the topics of 8. Decent work and economic growth, 9 Industry, Innovation and Infrastructure, 11. Sustainable cities and communities, 12. Responsible consumption and production, 15. Life below water.

My project is going to focus on the sustainable food production and consumption that will also benefit the water conditions of Limfjorden through the oysters ability to help filtrate the water. Also I intend to reuse oyster shells as part of the design and building material. Part of the idea is to attract more tourists to the area as part of a knowledge sharing program and thereby help the local community to maintain or re-establish their relevance. Hopefully this can help the area secure future jobs for the locals as well as the wealth of the area and its rich nature.



Photo 8. UN sustainable development goals

## METHODS AND TECHNIQUES

## RESEARCH

As part of my research process I will do anthropological studies through qualitative interview with existing oyster farmers in the area as well as the locals on Gjøl to investigate into the history of the area and the visions for further development. I will collect my findings of anthropological interviews, material and flora registration, building tradition and the landscape of the area throughout seasons in an Atlas. I will look at references globally to understand the operation and needs of an oyster farm.

## DESIGN

I will work in various scales, starting with the context to understand the infrastructure between the oysters in the waters to where on land the facilities will take place. After this I will go more into building scale, spatial scale and tectonic scale to show materiality and detail of the design. I will work in both model and sketches, both as a process tool as well as for presentation. I will investigate and experiment with oyster shells as a repurposed building material as an active part of my final design.



Context model reference,  
Architectural studio PWFERRETTO, pottery museum, South Korea

# 6

## FORMALITIES DELIVERABLES

### DELIVERABLES FOR CRIT#1:

Program

### DELIVERABLES FOR CRIT#2

Context drawing showing infrastructure.  
Atlas of the area collecting photos etc.  
Diagram of function of the building.  
Sketch proposals of the building  
Sketch models of the building

### DELIVERABLES FOR CRIT#3

Context model.  
Refined sketch proposals of the building.  
Sketch proposals of significant spatial elements.  
Sketch models of building.  
Material experiment with shells as a building material.  
Sketch proposal of significant tectonic detail.

### DELIVERABLES EXAM:

Program  
Atlas  
Context mapping

Proposal for building situated in the landscape.  
Populated section and plan of building. 1:50 or 1:100.  
Facade drawings showing materiality  
Drawing of significant tectonic detail 1:10 or 1:20

Visualisation of significant spatial element.

Sketch models (process)  
Site model showing building in context.  
Presentation model 1:50 of a significant part of the building.  
1:1 model experiment of shells as a building material.

# FORMALITIES

PRESENTATION PLAN

Program  
Atlas  
Context mapping

Proposal for building situated in the landscape.

Populated section and plan of building. 1:50 or 1:100.

Facade drawings showing materiality

Drawing of significant tectonic detail 1:10 or 1:20

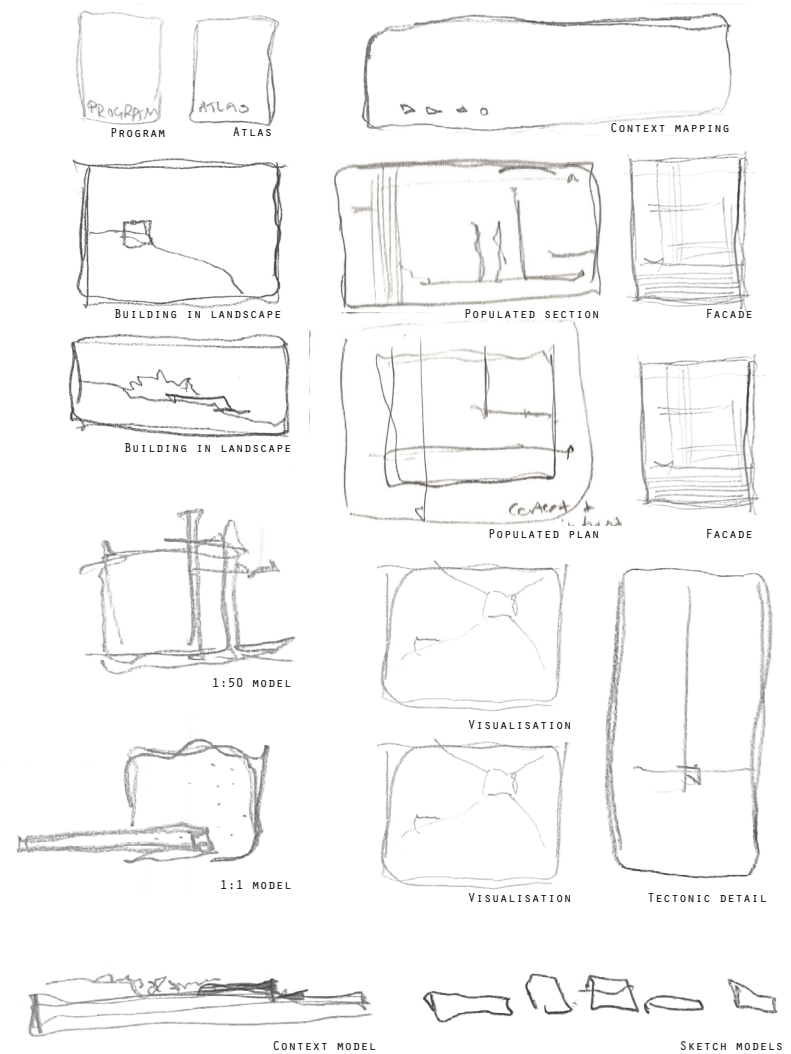
Visualisation of significant spatial element.

Sketch models (process)

Site model showing building in context.

Presentation model 1:50 of a significant part of the building.

1:1 model experiment of shells as a building material.





# FORMALITIES

SCHEDULE

|                                   | Monday  | Tuesday   | Wednesday  | Thursday  | Friday   |
|-----------------------------------|---|---|--|---|--|
| week 5 (1)<br>1 - 7 feb           | <b>TUTORING.</b><br>Program writing.                                  | Program writing.  | Program writing.   | Program writing.  | Send program draft to Scarlett.<br>Make timetable.<br>Make presentationplan. |
| week 6 (2)<br>8 - 14 feb          | <b>TUTORING.</b><br>Program writing.                                  | Program writing.  | Program writing.   | <b>Hand in final program</b><br>Prepare crit#1 presentation.  | <b>Crit #1</b>   |
| week 7 (3)<br>15 - 21 feb         | Wrap up on crit#1   | Gjel. Atlas collection, photos etc from the area.<br>Materiality, atmosphere research, + drawing on site. | Gjel. Atlas collection, Interview with locals etc. anthropological research.   | Visit Vene oyster farm.   | Collect and produce Atlas.   |
| week 8 (4)<br>22 - 28 feb         | <b>Thesis catalyst boot camp</b>                                      | <b>Thesis catalyst boot camp</b>  | <b>Thesis catalyst boot camp</b>   | Wrap up on workshop.  | Work on Atlas.   |
| week 9 (5)<br>1 - 7 marts         | <b>TUTORING.</b><br>Work on Atlas.                                    | Work on Atlas.  | Work on Atlas.   | Context drawing showing infrastructure.   | Context drawing showing infrastructure.                                      |
| week 10 (6)<br>9 - 14 marts       | <b>TUTORING.</b><br>Sketching + model sketching of building           | Sketching + model sketching of building   | Sketching + model sketching of building  | Sketching + model sketching of building   | Sketching + model sketching of building                                      |
| week 11 (7)<br>15 - 21 marts      | <b>TUTORING.</b><br>Drawings of first iteration, plans + section      | Drawings of first iteration, plans + section  | Drawings of first iteration, plans + section   | Drawings of first iteration, plans + section  | Drawings of first iteration, plans + section                                 |
| week 12 (8)<br>22 - 28 marts      | <b>TUTORING.</b><br>Diagram in section evt                            | Diagram in section evt  | prepare for crit #2  | <b>Crit #2</b>  | <b>Crit #2</b>   |
| week 13 (9)<br>29 marts - 4 april | <b>(easter holiday)</b><br>Material experiment                        | <b>(easter holiday)</b><br>Material experiment  | <b>(easter holiday)</b><br>Material experiment   | <b>(easter holiday)</b><br>Material experiment  | <b>(easter holiday)</b><br>Material experiment                               |
| week 14 (10)<br>5 - 11 april      | <b>TUTORING.</b><br>Sketch proposals of significant spatial elements. | Sketch proposals of significant spatial elements.   | Sketch proposals of significant spatial elements.  | facade<br><b>Lecture Series "The Complex Interior": Pierre D'avoine</b>   | facade   |
| week 15 (11)<br>12 - 18 april     | <b>TUTORING.</b><br>Context model                                     | Context model   | Context model  | Context model<br><b>Lecture Series "The Complex Interior": Alison J. Clarke</b>   | Context model  |
| week 16 (12)<br>19 - 25 april     | <b>TUTORING.</b><br>Context model                                     | Context model   | 9-13: Optional verbal presentation workshop with actress Natasja Arcel: Communal workshop<br>Context model   | Context model<br><b>Lecture Series "The Complex Interior" Eli Moseyebi</b>  | Context model  |
| week 17 (13)<br>26 april - 2 maj  | <b>TUTORING.</b><br>refined drawings                                  | refined drawings  | Optional verbal presentation workshop with actress Natasja Arcel: Individual 1 hour session #1<br>refined drawings   | refined drawings  | refined drawings   |
| week 18 (14)<br>3 - 9 maj         | <b>TUTORING.</b><br>Tectonic detail                                   | Tectonic detail   | Prepare for crit #3  | <b>Crit #3</b>  | <b>Crit #3</b>   |
| week 19 (15)<br>10 - 16 maj       | <b>TUTORING.</b><br>Facade  | facade  | facade   | <b>(public holiday)</b><br>refined drawings   | <b>(public holiday)</b><br>refined drawings                                  |
| week 20 (16)<br>17 - 23 maj       | Presentation model 1:50 of a significant part of the building.        | Presentation model 1:50 of a significant part of the building.  | Presentation model 1:50 of a significant part of the building.   | <b>Lecture Series "The complex Interior": Lois Weinthal</b><br>Presentation model 1:50 of a significant part of the building. | Presentation model 1:50 of a significant part of the building.               |
| week 21 (17)<br>24 - 30 maj       | <b>(public holiday)</b><br>Visualisation                              | Visualisation   | Submission by 12 AM latest for any written material. Voluntary submission of project for examination no later than 12 AM at latest. (form will be announced) | Visualisation   | Visualisation  |
| week 22 (18)<br>31 maj - 6 juni   |   | Optional verbal presentation workshop with actress Natasja Arcel : Individual 1 hour session #2           | <b>PRINT</b>   | <b>PRINT</b>  |  |
| week 23 (19)<br>7 - 13 juni       | <b>Examweek</b>   | <b>Examweek</b>   | <b>Examweek</b>  | <b>Examweek</b>   | <b>Examweek</b>  |

## BIBLIOGRAPHY

Graversen, E. Peter, *Limfjorden skal være skaldyrdestination!*, havneguide.dk.  
<https://havneguide.dk/da/nyheder/limfjorden-skal-vaere-skaldyrsdestination>  
Seen: 06.02.21 11.02

Hansen, F. Kasper, *Denmark's Limfjord Oysters – Probably the Best Oysters in the World*, Honestcooking,  
<https://honestcooking.com/limfjord-oysters-probably-the-best-oysters-in-the-world/>  
Seen: 08.02.21 14.50

Interreg - European Regional Development Fund, 2012, *Byggesten til et succesrigt nordisk østerserhverv*, Göteborgs Universitet.

Limfjordsrådet, 2017, *Håndbog til fjordhaver i limfjorden*, Limfjordsrådet & Norddea Fonden.

Sheehan, S. Michael & Sickels-Taves, B. Lauren, 2002, *Vernacular building materials and the factors conditioning their use: Tabby, A case Study*, International Society for Landscape, Place & Material Culture, Material Culture FALL, Vol 34, No. 2.

Udenrigsministeriet, 2019, *Målsætninger og forvaltningsprincipper for muslinge- og østersskrab og øvrig muslinge- og østersproduktion i og udenfor Natura 2000 områder*, Udenrigsministeriet.

<https://fiskeristyrelsen.dk/media/10650/muslinge-og-oesterspolitik.pdf>

Photo 1.  
Limfjorden, Gjøøl, 202. Andersen Camilla, private photo.

Photo 2.  
The fishermen on Limfjorden. From the film adaptation of The Fishermen in 1977.  
<https://www.tv.nu/program/fiskerne/sasong/1/avsnitt/1>

Photo 3.  
Oyster picking by Limfjorden. Danmarks Naturfredningsforening.  
<https://www.dn.dk/nyheder/saml-selv-nytarsosters/>

Photo 4.  
Limfjordsøsters served as a nugget. By Venø Fish Farm.  
<https://venoeseafood.dk/opskrifter/>

Photo 5.  
Limfjordsoyster served raw.  
<https://www.pinterest.dk/pin/414049759499061796/>

Photo 6.  
Oyster farm by Sean Guale, 2010, uk.  
<http://www.presidentsmedals.com/Entry-25341>

Photo 7.  
Sydney Harbour Pavillion made of recycled oyster shells, by SPRESSER and Peter Besley, Australia.  
<https://www.archdaily.com/955180/sydney-harbor-pavilion-will-be-built-with-recycled-oyster-shells>

Photo 8.  
Un sustainable development goals.  
<https://sdgs.un.org/goals>

Photo 9.  
Context model reference,  
Architectural studio PWFERRETTO, pottery museum, South Korea  
[https://www.archdaily.com/449398/winning-entry-for-new-pottery-museum-in-south-korea-pwferretto-utop?ad\\_source=myarchdaily&ad\\_medium=bookmark-show&ad\\_content=current-user](https://www.archdaily.com/449398/winning-entry-for-new-pottery-museum-in-south-korea-pwferretto-utop?ad_source=myarchdaily&ad_medium=bookmark-show&ad_content=current-user)