Seaweed Underwater Forest in Ísafjördur

- Proposal by Lisa Vidal, Student of the University Centre of the Westfjords –

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Within the scope of my Master's Thesis in *Coastal and Marine Management*, I would like to develop an 'Underwater Forest' in the inner fjord of Ísafjördur, consisting of seaweed. The project will stretch about one year from July/August 2018 to June/July 2019.
The following presents a first proposal of the purpose and methods which could be applied when starting the project, but may also change in detail during the planning process. The location of the project won't be changed once the admission is obtained.

Purpose

The main objective of the 'Underwater Forest' shall be to observe if the planted seaweed is able to grow in an effective way in this area. If so, the seaweed could be used to improve the water quality and to resettle marine fauna and flora in the fjord. In this connection, the construction could also be used in the future for further research projects of UW students or other organizations in this branch.
In addition, the seaweed could be harvested and observed for possible usage for algae products. An underwater camera could be affixed and used for representation of the village and the project.
Furthermore, the project shall not only be fundament for my Thesis but can also be useful for business in the Westfjords in general as it reflects an innovation project to investigate the environmental and economic uses of seaweed in this area.
In the nearer future, the 'forest' may also be used for school classes for educational purposes or as a tourist attraction, not least to raise awareness of environmental issues and innovations.

In conclusion, the 'Underwater Forest' shall represent a sustainable and reproductive project which strengthens the image of Ísafjördur as an innovative and environmental friendly place and can be used for future business plans in the Westfjords.

Location

The 'Forest' shall be placed in the inner waters of the fjord of Ísafjördur, on the way to Bonús on the left side where you can find a small ledge going into the fjord (see Fig. 1+2). The ledge

Fig.1: Location of the project (1) in red circle (Photo credit: Google Maps, 2017).

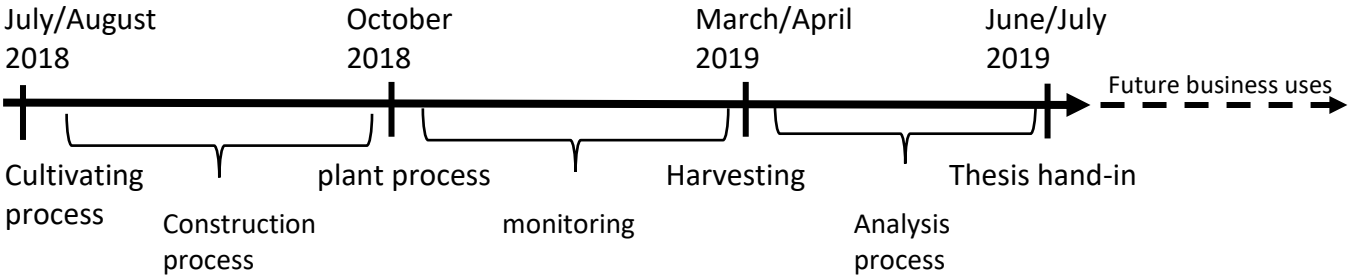
would be an ideal location to get access to the construction for research or also for school classes and visitors. Furthermore, it would be a good representing point if entering the village, for example by placing a street sign which names Ísafjördur as the village which this special project. The exact side of the ledge is not decided yet since further information has to be obtained regarding the location.
However, for demonstration purposes, I used the left side of the ledge in the following.

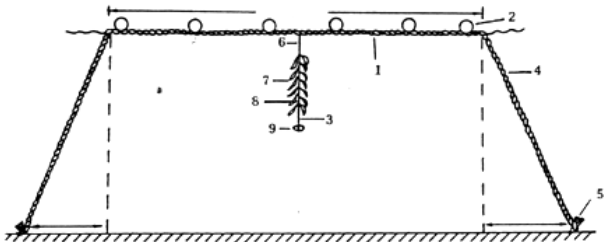
Fig. 2: Location of the project (2) with red lines marking the project area.

Methodology

After cultivating young kelp sporophytes for 7-8 weeks, they will be planted on hanging ropes which are stabilised by a weight at the end and placed on a single floating rope held by buoys and anchored (wooden) stakes on both sides (similar to Fig. 3). In total, the construction would need a place of approximately 150 m x 100 m. There are two proposals how the construction could look like from the water surface. The first proposal includes at least five single floating ropes, structured one behind the other (see Fig. 4). To make the construction more aesthetic for the public, the ropes could also be structured differently so that the buoys present a certain form at the surface, for example an anchor or a seastar (see Fig. 5).
During the research period which probably will take place from October 2018 to April 2019, I will monitor the construction in regular intervals with the aim of a Kayak or by diving to the spot. In spring 2019, the seaweed will be harvested by cutting the blades from the ropes. Afterwards, I will observe the nutrients absorption and range of applications of the algae plants. These observations together with the developing way of the 'Underwater Forest' will then outline my Master's Thesis.
The project will primarily be in the scope of the University Centre of the Westfjords, however, several companies will probably be involved to fund the project.

The following time line gives a roughly overview about the process steps:





Single floating rope raft.
1: floating rope
2: buoy
3: tying rope
4: anchor rope
5: wooden anchor stake
6: connecting rope
7: young kelp sporophytes
8: hanging culture rope
9: weight

Fig.3: Sideview of seaweed construction (Photo credit: FAO, 2003).

Fig.4: Proposal no.1 with five single floating ropes (not to scale).

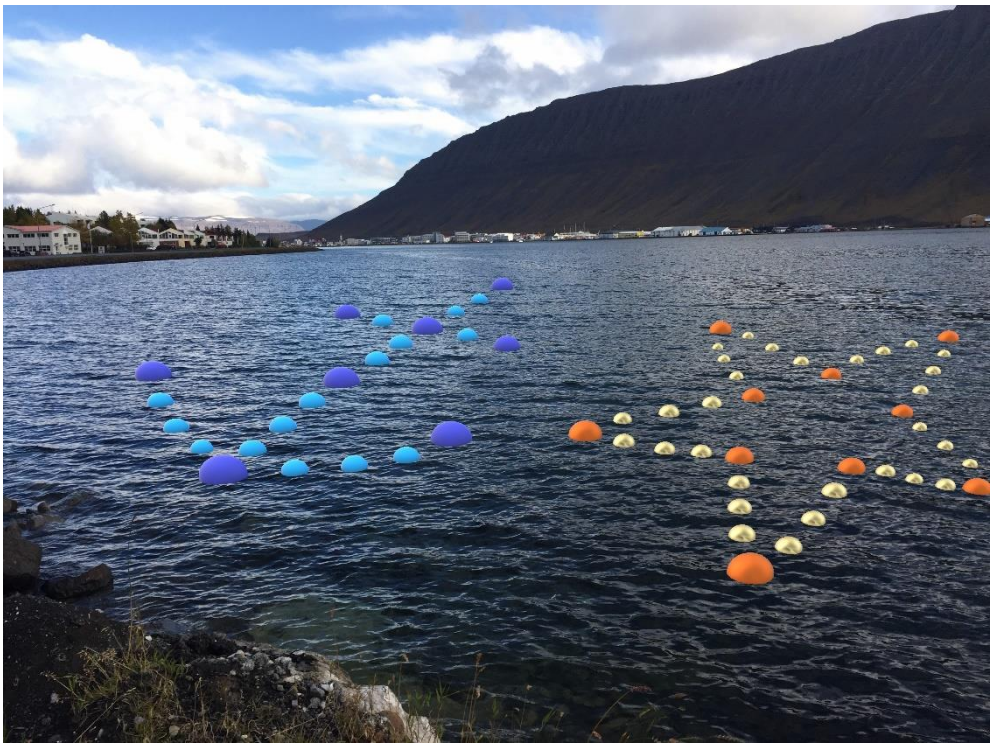


Fig.5: Proposal no.2 with buoys forming an anchor and a seastar (not to scale).

References:

Google Maps, 2017.

http://www.fao.org/3/contents/a772bf3d-29f6-5025-bf95-8cfe046155c4/AB724E02.htm#ch2.1.