NEWSLETTER SEPT 2022

SW-GROW Final Conference

The final SW-GROW conference was hosted by UHI Outer Hebrides on 6th September 2022 with results from the last 3 years presented by partners.

The objective of the project has been to increase economic opportunities in the seaweed industry by developing innovative working practices that can be widely adopted by SMEs involved in the industry and to develop quality seaweed products of consistent standard that are identifiable and can be clearly branded. The key areas presented by Partners were:

- Drying, demonstration of web-based App for energy Assessment for SMEs (Outer Hebrides UHI)
- Characterisation, Carbon and nitrogen, ash and calorimetric content (Swedish University of Agricultural Sciences)
- Comparison of Drying Methods and characteristics of seaweed based on seasons (Arktisk Teknologi Center, Greenland)
- Cultivation quality and growing guidance for the NPA region. Renewable energy using hydro power (Tari - Faroes)
- Use of shared infrastructure / resource opportunities (Údarás na Gaeltachta)
- DNA data base of seaweed species, characterisation of genetic markers, an NPA seaweed genetic database and testing kit for NPA seaweed provenance (NUI Galway)
- Waste to fuel and Biofuel production (University of Iceland) Launch of SW-GROW brand / Marketing and cultural story of seaweed (An Lanntair)
- Traditional culinary uses of seaweed in the Western Isles (Alasdair MacLeod)

The conference gave academics, local businesses, and the public the opportunity to hear more about the project, view demonstrations of new digital apps and seaweed drying process and discuss the development of a new seaweed genetic database.

Local seaweed businesses also participated in the conference and brought a variety of seaweed products from beauty, tasty food, and drink. Stag Bakery from Stornoway gave us an insight into their business and delicious samples of biscuits which included seaweed. Ishga and Hebrides Seaweed described their organic skincare business and provided samples as well as the Harris Distillery with samples of their award-winning gin (incorporating sugar kelp). Many thanks to all the companies for their participation.

Projects partners also took part in a boat trip around Little Bernera and saw the beautiful sights of the west coast of the Isle of Lewis. Many thanks to UHI Outer Hebrides for hosting the conference.

Technical University of Denmark – Shelf-life of sugar kelp

The Technical University of Denmark have recently had their paper accepted regarding the shelf-life of sugar kelp in a special issue of Frontiers in Food Science and Technology called *"Algae as Food and Ingredient: From Production to Consumer Acceptance".*

Part of the manuscript for Frontiers is a Contribution to the Field Statement.

Sugar kelp is an emerging food source and is estimated to play an important role in the green transition of the food sector. The shelf-life of sugar kelp and post-harvest changes of washed or blanched sugar kelp are currently poorly understood. Understanding shelf-life and the effects of post-harvest treatment will help the food sector (manufacturers, restaurants, retailers, and farmers) to know the time-frame they have before the kelp must be stabilized. This study investigates the spoilage with regard to most quality attributes (sensory, microbial, chemical, and physical). It is, therefore, vital documentation of quality changes in the post-harvest storage period. Besides guiding the food sector, this study will act as a fundamental understanding to the research community of spoilage and micronutrient changes during refrigerated storage of sugar kelp. Food manufacturers interested in applying sugar kelp in their products can use these findings as a best practice in their production.

The paper is currently in post-production, but the abstract is available online and can be found here:

https://www.frontiersin.org/articles/10.3389/frfst.2022.1030229/abstract

Údarás na Gaeltachta – SW-GROW Shared Drying Infrastructure Pilot Project

The Pilot project involved two elements: T1.2 Energy Efficiency & T1.2.2 Shared Infrastructure

T1.2 Energy Efficiency

"SME's will be approached to take part in a pilot to assess their energy use and to help them change their methods to use renewable technology and to adopt practices that minimise the use of energy in all areas of activity. Currently seaweed processors use a variety of fossil fuels, e.g coal and kerosene, to dry the raw product. This is environmentally damaging in terms of emissions – and adopting renewables and energy efficiency measures will make producers more financially viable and will reduce harmful emissions of pollutants and greenhouse gasses."

T1.2.2 Shared Infrastructure

"Pilot with SME's in one geographical area to determine if sharing infrastructure in drying would be of benefit." Deliverable Target value: 1

An expression of interest form was developed to determine SME's suitability for participation in a pilot project. The expression of interested form was openly advertised and circulated amongst Údarás na Gaeltachta's associate project partners and client companies.

There were several difficulties involved in selecting two SME's that would be suitable. These included:

- Geographic location – the SME's must be in proximity to make the sharing of infrastructure viable with low transport costs.
- Method of drying – the SME's must use the same method of drying
- Type of species – the SME's must be able to dry the species required
- Different standards of drying are required for organic seaweed and seaweed for human consumption.

Based on these factors Connemara Organic Seaweed, Co. Galway and Dúlra Seaweed, Erris, Co. Mayo were selected. These two companies were compatible in the species of seaweed used and the type of drying. The two SME's also complimented each other as Connemara Organic Seaweed is an established company and for generations they have harvested seaweed off the Connemara Coast and in contrast Dúlra is a start up company.

Sharing Arrangement

The sharing agreement was one in which one partner relied on another partner to specifically use the drying infrastructure and equipment.

Potential benefits and challenges from infrastructure sharing arrangements

Potential Benefits: There are many potential benefits associated with infrastructure sharing. These include potential cost-saving benefits especially where the cost for a single operator is high. In essence sharing of infrastructure could maximise the use of equipment and ensure a higher return on capital investment. Infrastructure sharing could be used as a means of overcoming challenges where deploying equipment is difficult and expensive. In the case of the Irish pilot, it overcame operational challenges for the start-up SME as Dúlra was in the process of fitting out a new premises. Sharing might also lead to increased consumer choice as more products could be produced especially when it would not be economical for each partner to have their own equipment. Sharing also has environmental benefits as it reduces energy consumption and maximises use of equipment in circumstances where it might not be used all the time.

Renewable energy solutions

With soaring energy costs, the potential for renewable energy solutions was investigated. An energy audit was conducted and our partners from UHI Outer Hebrides also made recommendations. It was advised that a combination of solar PV, batteries and heat pumps would be of benefit. If permissible under planning regulations the potential for wind generation must also be explored. As the building was not purpose built no natural sunlight exists either. Connemara Organic Seaweed uses very basic drying techniques and therefore there is potential for cost saving renewables.

Challenges and downsides associated with sharing

Sharing of infrastructure requires planning and coordination between both parties. Both parties were involved in multi-species farmed harvesting and drying. Sharing was extremely difficult as both parties were harvesting at the same time which led to capacity issues and one party having to slot in during leap tides as this was the only slot available. This slot was weather dependent and there was a risk that the slot would be lost in the event of unfavourable weather. Essentially both SME's were harvesting at the same time and were running into problems regarding capacity.

Recommendations

The parties believed that a shared infrastructure could work in theory, but that equipment and infrastructure would need to be purchased and shared equally. This pilot involved essentially one party using another party's equipment and therefore they were not equal partners as the owner of the equipment had priority.

The parties believed that shared infrastructure could work better across different industries for example with hemp growers as the parties would not be harvesting at the same time. The parties also agreed that the shared infrastructure would work better with SME's that were drying one species of seaweed as it would be easier to plan around the harvesting season as it is difficult to plan around multi-species harvesting.

The SME's also believed that the incorporation of renewable energy solutions could lead to reduced energy costs and reduction in emissions. Drying techniques must also be reviewed and the possibility of intermittent drying investigated.

It was also suggested that a state agency might be better equipped to build and manage a purposed built facility for drying for SME's in the seaweed industry.

University of Iceland SW-GROW project outcomes

The research team at the University of Iceland studies new biofuel sources, such as seaweed, to replace fossil fuels and reduce carbon emission. Using seaweed, rather than conventional feedstock such as rapeseed or soy or managed forestry, to produce renewable fuel achieves several desirable goals in addition to the obvious benefit of avoiding ILUC harms. Seaweed cultivation also balances the pH in the oceans, absorbs extra carbon from the atmosphere and consumes neither fresh water nor fertilizer. This study used Bladderwrack seaweed, species that grows naturally and abundantly at seashores. The team demonstrated and studied both the drying and pelletizing of Bladderwrack. The moisture content of freshly harvested seaweed is around 80%. The pelletizing process is an excellent option to prepare seaweed for storage, transportation and/or conversion to gaseous, liquid or solid biofuel. However, drying and shredding of biomass is necessary before pelletizing. The research in this project showed that to produce high-quality pellets, the moisture content of the biomass mixture should be reduced to less than 20%. The seaweed pellets thus produced can resist up to 200 N compression force and their average density is 1.1 g/cm^3. This amount of hardness prevents the pellets from collapsing or crumbling during transportation, gasification, or most of the intended applications. The energy content of seaweed pellets produced in the study is around 14 MJ/kg. By blending in wood chips or sawdust to the seaweed before pelletizing, it is possible to increase the energy content of the product.

In summary, the research team at UoI successfully demonstrated the drying and pelletizing of Bladderwrack. Pellets with mechanical and chemical properties suitable for storage, transportation and conversion to biofuel was demonstrated.


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UHI Outer Hebrides
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Co-financing ERDF
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SWGROW
Innovations for Seaweed Producers in the Northern Periphery Area
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SWL 200kg
seaco
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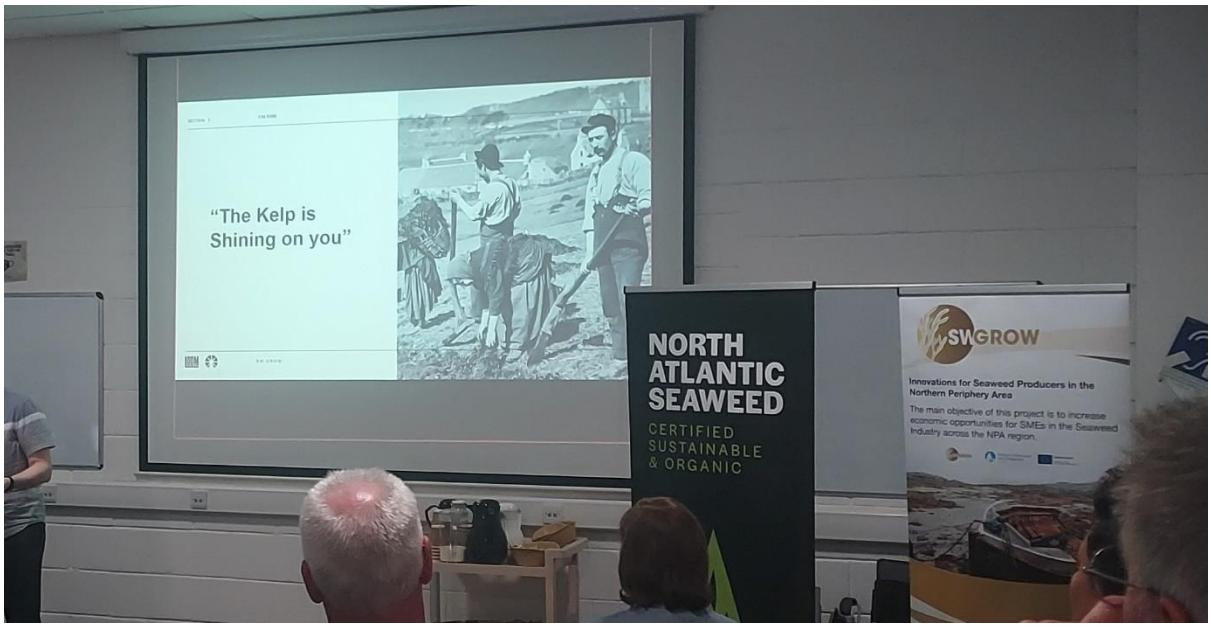
"The Kelp is
Shining on you"
NORTH
ATLANTIC
SEAWEED
CERTIFIED
SUSTAINABLE
& ORGANIC
SWGROW
Innovations for Seaweed Producers in the Northern Periphery Area
The main objective of this project is to increase economic opportunities for SMEs in the Seaweed Industry across the NPA region.

SWGROW

Northern Periphery and Arctic Programme
2014-2020

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