Bwyd-Natur-Lles
Tyfu Dyfi
Food-Nature-Wellbeing

Dyfi Biosphere food system scoping study report summary

Sept 2022

Table of contents

Introduction

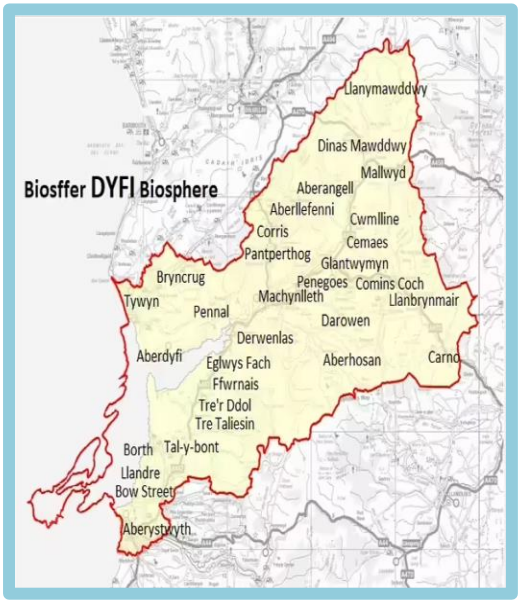
The Tyfu Dyfi project, funded by the Welsh Government's Enabling Natural Resources and Well-being scheme (ENRAW), running between August 2021 and June 2023. Concentrated in the Dyfi Biosphere area of mid-Wales, it has a multi-faceted approach, encompassing the overarching principles of diversifying food production using agroecological practices with the aims of enhancing food security, enriching biodiversity, addressing the climate crisis and promoting local community well-being.

In order to get more people involved in growing and boost the local food economy the project activities include: establishing new community growing sites, training new horticultural producers, trialling new crops at field scale using agroecological practices, education and community composting as well as focusing on food distribution.

This report relates to food distribution.

Dyfi Biosphere area

The focus of the study is within the Dyfi biosphere area. Biospheres Reserves are designated by UNESCO[1](United Nations Educational Scientific and Cultural Organisation) and are 'areas of land and marine ecosystems or a combination, which are internationally recognised within the framework of UNESCO's 'Man and the Biosphere (MAB) programme' (2022)[2]



Population

The Dyfi biosphere is a largely rural area comprising relatively small towns and villages. From the 2011 census, is home to some 26,100 people[3], with the bulk of the population (including students) living in Aberystwyth followed by Tywyn, Machynlleth and Borth.[4]

Figure 1 : Dyfi Biosphere area[5]

[1] UNESCO

[2] Man and the Biosphere (MAB) programme

[3] Dyfi Biosphere: https://www.dyfibiosphere.wales/dyfi-biosphere-wales

[4] City Population figures https://www.citypopulation.de/en/uk/cities/wales/?cityid=34856 citing 2020 census data

[5] https://www.dyfibiosphere.wales/dyfi-biosphere-wales

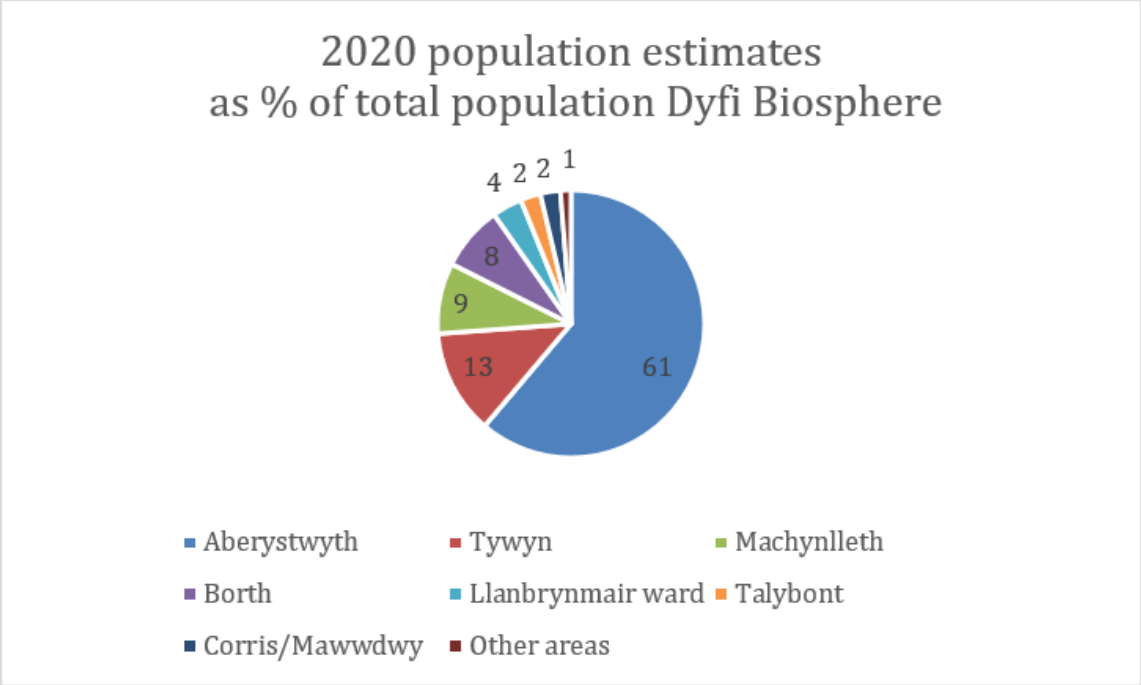


Figure 2 : 2020 Estimated population figures in the Dyfi biosphere. Source City Population[6]

Background

If we are to create a more sustainable future, there are a multitude of increasingly urgent issues that contribute to the need for rethinking food systems.

As with much of the UK, the Welsh food system is intrinsically linked to the wider UK and international networks of food supply with all their associated fragility. Lang (2020), has calculated that as few as eight companies control 90% of UK food supply. These companies control how our food is produced, the quality of food provided, the price we pay, and ultimately, how the land is used. As outlined by Duncan Catchpole (2021), *'If we want to redress the balance of power in our food supply then creating resilient local food systems which exist outside of large corporations is a must'.*

Some of the challenges we face;

Climate change & biodiversity emergencies

The IPCC Climate change report, (2022) sets out how climate change has already had diverse adverse impacts on human systems, including on water security and food production, health and well-being, cities, settlements and infrastructure. The climate change emergency (created in part by our food systems) is leading to more frequent extremes of weather & biodiversity losses, drought, deluge,

[6] https://citypopulation.de/

floods, wind and storms, pests and disease which are increasingly adversely impacting food production, leading to much uncertainty, unpredictability and crop failures. Additionally, as the pressure to achieve 'Net Zero' emissions, increases, this in turn could lead to more land being taken out of food production in the drive to plant trees as well as Corporations buying up farmland for afforestation to satisfy carbon offsetting schemes.

Much of our food systems are built on mass industrialised production of food with crops designed for convenience of harvesting and profit. The way we produce our food has a profound impact on our health and the environment. Our food system has changed over time with crops grown at ever increasing scale, with a narrow range of plant diversity and a reliance on agrochemicals. This in turn leads to an increase in pests and diseases and subsequent crop failures associated with monocultures as well as the effects on the climate and biodiversity from agrochemical use. Examples of pathogens getting a foothold can be seen with the fungi affecting bananas currently and historically the deadly Irish potato famine of 1845-49

To mitigate against this, rethinking our food production systems is crucial, increasing the range of plant varieties grown, on smaller scales, with produce grown closer to where it is consumed in a way that is in balance and enhances and protects nature.

GHG emissions from transportation and refrigeration

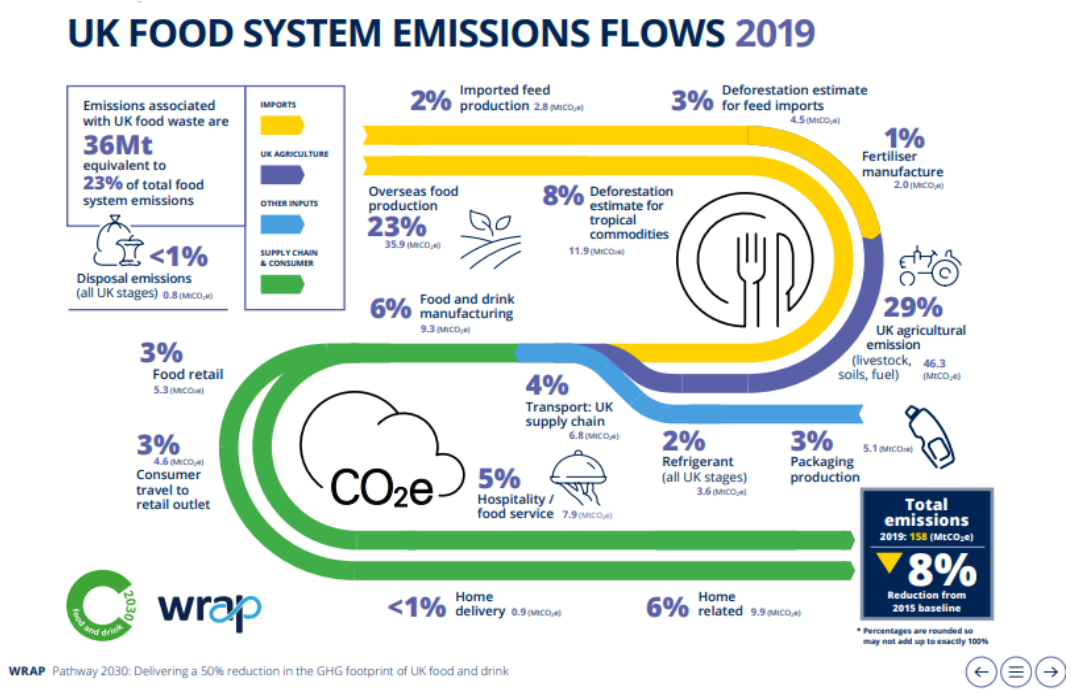


Figure 3 : WRAP 2019 UK Emissions flow diagram

According to the WRAP (2021) report 'Pathway 2030 delivering a 50% reduction in food and drink GHG emissions', the food & drink industry is responsible for around 35% of the total UK emissions. In turn, UK agriculture is responsible for around 29% of the UK 35% emissions figure, with 4% from the UK transport supply chain.

Brexit, Covid & War

Since Brexit, there has been an increase in the complexity and additional requirements for goods to enter the UK. This has led to inevitable delays and in turn threatens food security. Hart (2021) of 'Supply Management' refers to the "impenetrability of the paperwork" following the end of the Brexit transition period as being the biggest challenge faced by the food supply chain. Additionally, with the Covid pandemic and its multifaceted issues and its direct and indirect consequences it has become increasingly evident how fragile long supply chains can be.

The current war in Ukraine is having an effect on global food availability, particularly since a third of the world's wheat is supplied by Russia and Ukraine. Similarly, 70-80% of global exports of sunflower oil are exported from these countries and they are the 4th & 5th largest global producers of corn. All more reasons to focus on shortening supply chains.

Global food prices

These issues combined with unstable and escalating fuel, energy prices and inflation are having significant knock-on effects across the board including on food prices. Reflecting global trends, King et al (2021) describes how prices have risen steadily since May 2020. Furthermore, they found that the global impacts of the pandemic are likely to affect the UK's food system for some years to come with global food prices at their highest levels in a decade, the full extent of the impacts may not yet have been realised.

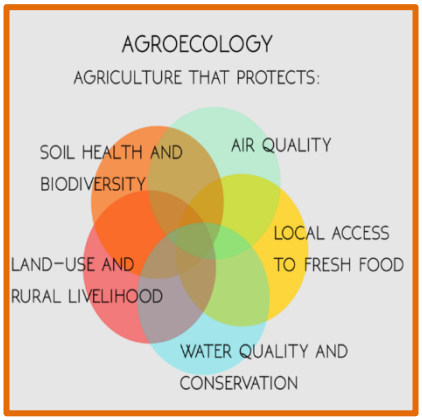
Many of the effects of the above-mentioned food related issues have been observed and described by Organic wholesalers, Watson & Pratt, in Wales in their weekly updates to customers outlining the various issues that have arisen during 2021-22. These include reporting shortages of labour to harvest crops, late crops, crop failures, transportation difficulties, Brexit paperwork and more. The result being periods of delay, shortages and the inevitable price increases.

A sustainable food system

There are several initiatives likely to change the landscape of food production and supply within Wales. In 2021, the Food Policy Alliance Cymru[7] (a coalition of organisations and stakeholders) set out their manifesto for building and promoting a collective vision for the Welsh food system which connects production, supply and consumption, whilst giving equal consideration to the health and wellbeing of people and the planet. Additionally, the Welsh Government Programme 21-26[8] has committed to developing a Wales Community Food Strategy to encourage the production and supply of locally-sourced food in Wales and to create a new system of farm support acknowledging ecologically sustainable food production. At the time of writing, there are financial incentives being offered in the area of horticulture by the Welsh Government with the implementation of the Horticulture Development Scheme [9]and the Small Grants for Horticulture Development[10]. In July 2022, detail on the Sustainable Farming Scheme[11] outline proposals were published. The latter aims to respond to the climate and nature emergencies as well as retain a focus on the sustainable production of food. It is acknowledged within this that '*the horticulture sector in Wales takes up a small area of agricultural land and contains a relatively small number of businesses. There is potential for us to grow more of the vegetables we eat here in Wales and the Scheme will support this with investment targeted at expanding and developing skills in this sector*'.

As these initiatives take effect and more produce is grown and made available within Wales, there will be more need to have efficient food distribution systems throughout the supply chain.

Agroecology



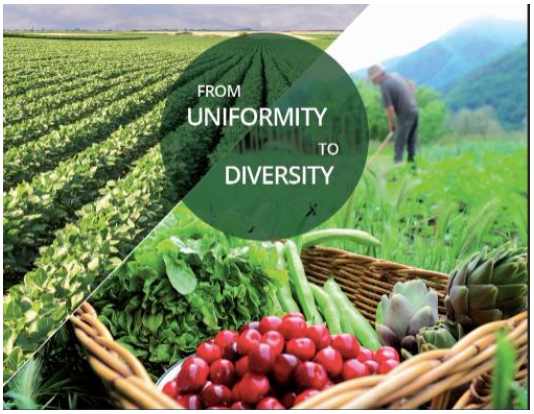
The focus of the project is on produce grown according to agro-ecological growing methods.

Defined simply by the Soil association (2022) 'Sustainable farming that works with nature'.

Figure 4 : Agroecology diagram[12]

[7] Food policy Alliance Cymru
[8] Welsh Government Programme 21-26
[9] https://gov.wales/horticulture-development-scheme
[10] https://gov.wales/small-grants-horticulture-start-up
[11] Sustainable farming scheme outline proposals
[12] http://allianceforagroecology.org/agroecology-1

Agroecology encompasses techniques to mitigate climate change, such as reducing GHG emissions, elimination of the use of agrochemicals, nutrient cycling, composting, and focusing on local supply chains. It works with nature, protecting and caring for the soil, taking care of wildlife and utilising biodiversity for natural pest control. Image credit[13]



It puts the growers and local people at the forefront, adapting growing methods & techniques to the needs and conditions of the local area.

Converting to agroecological growing systems is also one of the 6 priorities outlined in the Food Policy Alliance Manifesto[14] vision. The aim is to adopt agroecological principles across the whole food system, including 100% agroecological production by 2030 on all farms, in order to not only produce food, but also reverse loss of nature and increase climate resilience.

Shortening the supply chains

Short supply chains get produce from producer to customer more directly, involving fewer intermediaries, reduced Greenhouse Gas (GHG) emissions from transportation, storage, processing, and refrigeration. Whilst acknowledging that the emissions from transportation is a small percentage of the overall impact of the food system, shortening supply chains can increase local food security, local employment, inject vibrancy into a local economy, and avoid many of the disruptions that longer, increasingly global, supply chains are susceptible to.

Food hubs

As well as growing produce closer to home, having more direct sales between farmer and customer can shorten the supply chain and one method of facilitating this is through a food hub.

A defining feature of a food hub can typically be the traceability of produce from the local area, often with a set of guiding ethics and other principles. Food hubs can facilitate the selling of produce more directly from growers to consumers, increasing a sense of connection to food, acting as aggregators and distributors of food locally. They can open up new markets helping smaller and mid-sized farms

[13] Irish Environment
[14] https://foodpolicyalliance.cymru/wp-content/uploads/2020/11/FPACManifestoEnglish_091120.pdf

sell produce more directly to the consumer. They can also be much more than this, and deliver services encompassing social wellbeing, upskilling, and community building -focal points for inspiring change in the food sector. They can have a physical base and/or an online presence.

Examples of types of food hub

Figure 5: Food hub examples[15]

In the WWF commissioned study, Sanderson et al (2020) 'A Welsh Food System Fit For Future Generations', listed 10 interlinked themes for creating a new vision for Welsh food - sustainable food hubs feature as a part of this.

Figure 6 : 10 key interlinked themes for creating a vision for Welsh food Sanderson et al (2020)

Online trading platforms

Often food hubs facilitate the buying and selling of food via online trading platforms. The Open Food Network (OFN) is an example of this and has grown out of the sustainable food movement – it is a values driven, not for profit, open source, online international trading platform which aims for a fairer food system for food producers and customers. It functions by directly connecting producers with buyers. Because of the values driven approach, often times the aim is to facilitate fair trade between buyers and sellers which are underpinned with ethical values and sustainable growing aims.

[15] https://newfoodeconomy.org/csa-food-hub

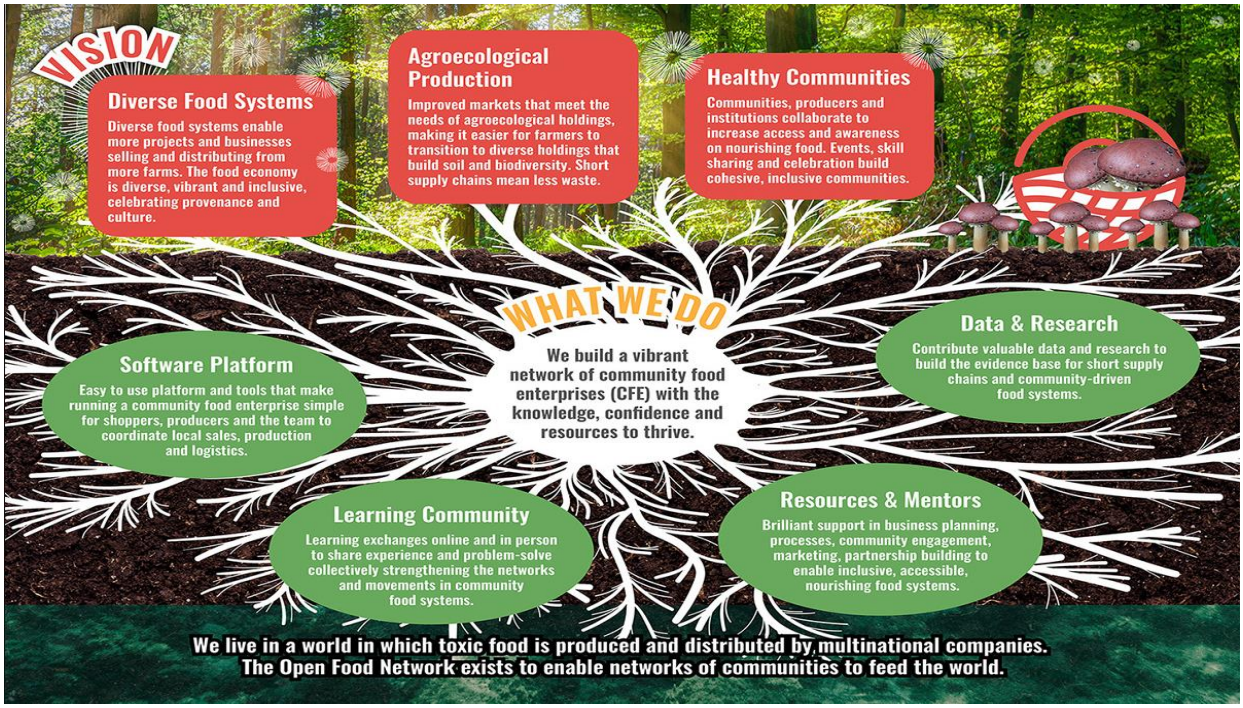


Figure 7: Open food network Infographic showing 'Why we exist'[16]

Welsh examples of online food hubs include Carmarthen Food[17] Aberystwyth Online Farmer's Market[18], and Haverfordwest Food hub[19]

Bwyd Dyfi hub

Bwyd Dyfi hub is an example of a hub which grew out of recognition of the need to connect producers and consumers in a more direct way, as well as shortening supply chains and increasing local food resilience - Bwyd Dyfi Hub was set up as a pilot project which ran for 3 months in late summer 2020 to provide an outlet for fresh locally grown vegetables for sale to local retail outlets. A number of the local producers created the overarching set of ethical values and ecological growing principles (see Appendix 1) giving purchasers confidence in the produce's origin. This hub was set up using the OFN as a trading platform, with a number of growers listing produce for sale. Local shops/cafe customers were able to purchase produce through the hub. The produce was aggregated one day a week in Machynlleth, then delivered to local businesses on the same day.

The pilot demonstrated demand and support for local food with encouraging feedback from retailers supportive and passionate about local food. The limitations of the hub were that the produce was

[16] OFN (2022)
[17] Carmarthen Food
[18] Aberystwyth Food Hub- online farmers' market - Home | Facebook
[19] Haverfordwest Food Hub - Open Food Network

mainly available at the peak of production in the summer with a limited range of produce, meaning that buyers still had to shop elsewhere and that the hub could only effectively run in the summer months which had implications for being financially self sustaining. Pricing was a challenge and a barrier to purchasing for some businesses.

Analysis of the local food system

Scope of food report

The scope was to research the Dyfi biosphere food system consulting with local primary vegetable (and fruit) producers, researching what fresh local produce was available.

The consultation process sought to draw on the grower's knowledge, experience and ideas with a view to establishing what produce was grown, logistics, growing methods, outlets and operations. Views were sought on the creation of an online food hub, exploring what the perceived barriers and opportunities for this were as well as and seeing whether there was interest in supplying a hub.

Outside the scope of this report

Due to limited time, resources available, and the focus on fresh local vegetables; a detailed look at the entire food system, including the mainstream, was not possible. In particular, the following components were out of scope for this exercise:

- Wide scale consultation with meat/dairy/cheese producers/fodder crop/grain producers, orchards or non-agro ecological producers such as chicken farms
- Analysis of the conventional mainstream supply chains, eg, the supermarkets, and public procurement
- Consultation with individual consumers
- Extensive secondary produce consultation

Land

Agricultural land classification in the Biosphere

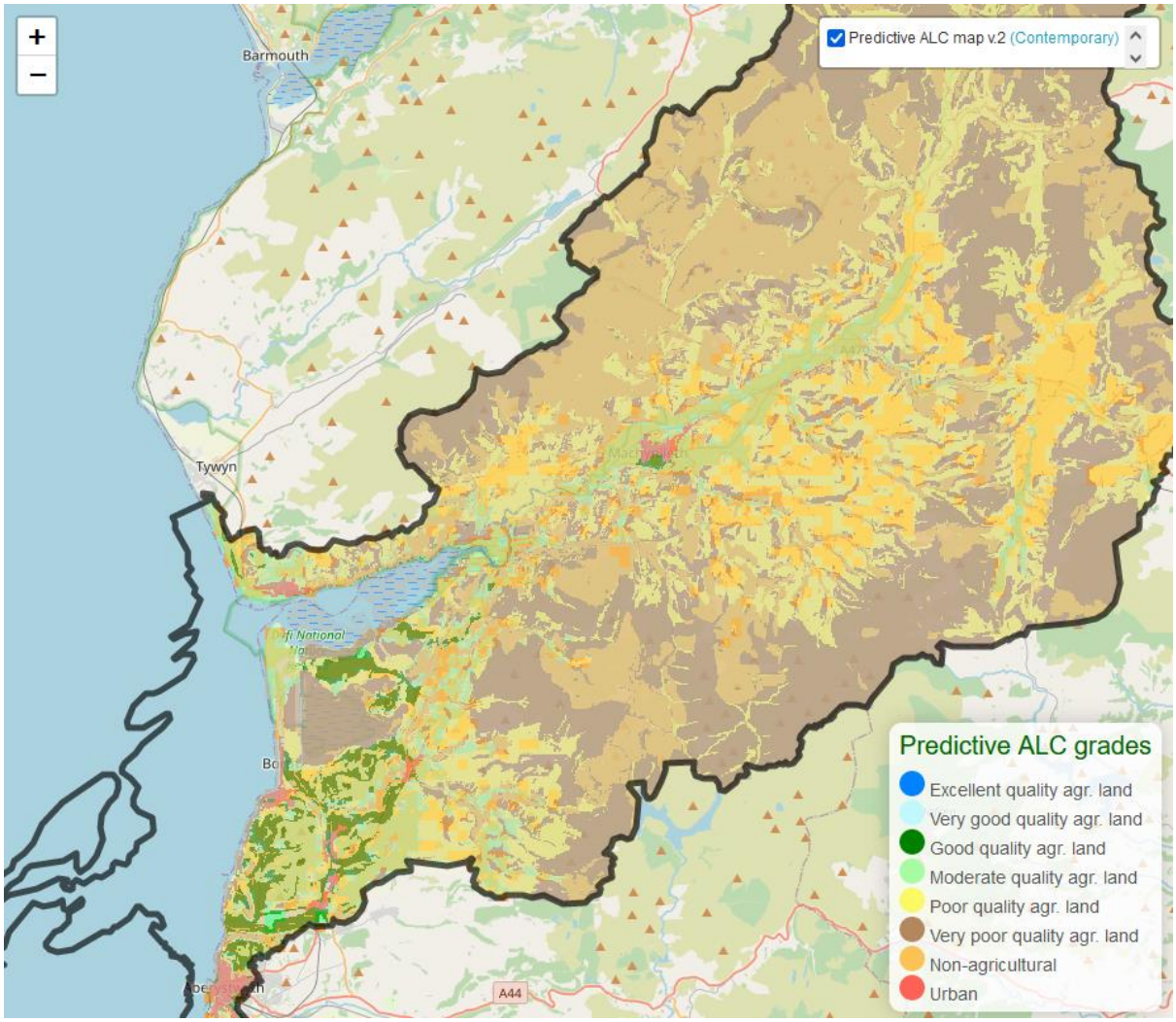


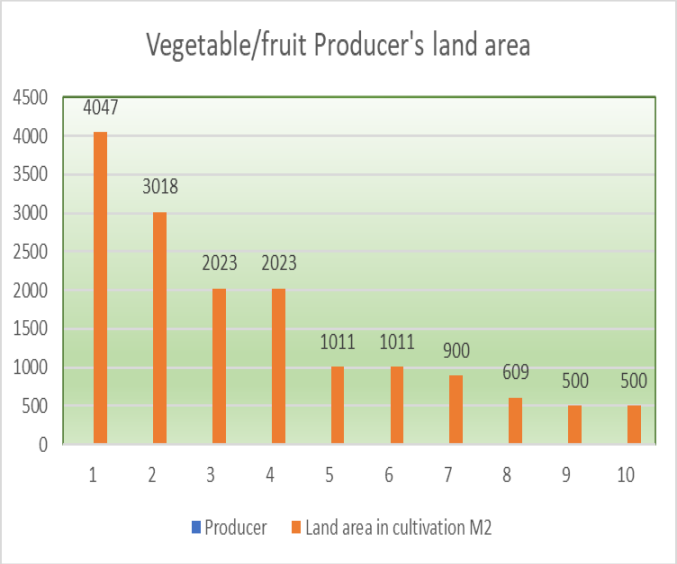
Figure 8: An Agricultural Land Classification map of the area[20]

The Figure indicates that much of the Biosphere area is upland and agriculturally classified as Less Favoured Area. Good quality agricultural land is concentrated in the coastal areas and in the valley floors.

Land in horticultural cultivation within the biosphere

Only a tiny area of land is in vegetable production - currently less than 5 acres, which includes a mixture of vegetables and some top and soft fruit production. A further 20 acres is in production of other crops with the Tyfu Dyfi Field Scale trial growers (see Field Scale Trials section).

[20] https://www.dyfibiosphere.wales/mixed-farming-histories-and-futures

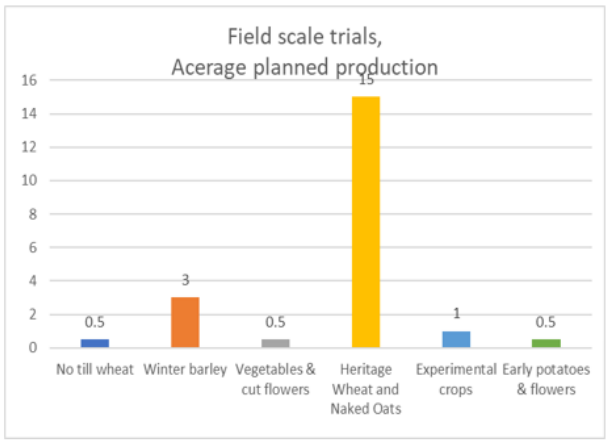


Of the vegetable producers consulted, just under half of the growing land is owned by the producers cultivating that land and access to land was cited by some as a barrier to increasing production.

Figure 9: Land area (m2) in commercial horticultural production

Field scale trials

Starting in April 2022, another component of the Tyfu Dyfi project is the Field scale Trials. This comprises a group of growers/farmers funded to test out their ideas for new crops on their land at a field scale. The field trials are experimental in nature, and these growers may be looking for outlets for their produce, depending on the success of their trials. A summary of the types of crops planned and area is given below, with land area approximately 20.6 acres.



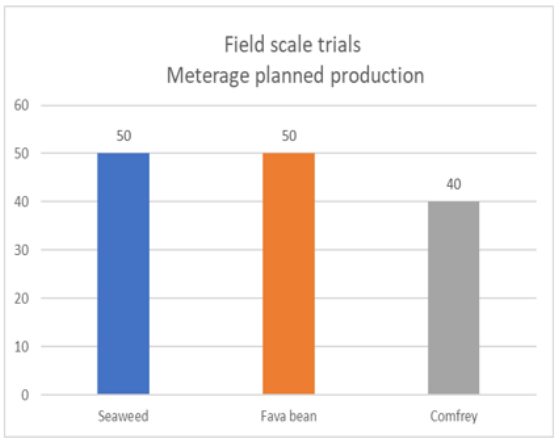


Figure 10: Field scale trials land area > 0.5 acre & Figure 11: Field scale trials land area 50m or less

Producer locations

As part of the LEADER funded *Mixed farming - histories and futures* project carried out mainly in 2021, a mapping exercise was conducted showing the location and source of some of the fresh local produce produced and sold in the area.

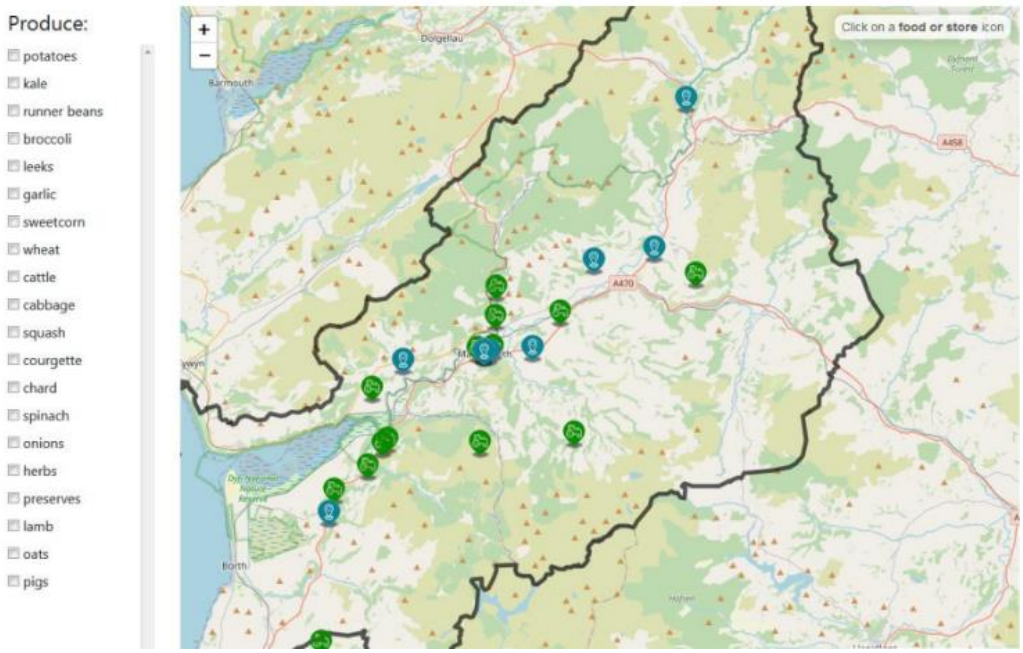


Figure: 12 Producers & distributors of fresh local produce within the Dyfi Biosphere area (Mixed farming history & futures project)

The majority of the primary vegetable producers within the Biosphere are located close to Machynlleth. 16 Vegetable /fruit producers were contacted across the Biosphere, of these, 2 are no longer growing and 3 are trainees taking part in the 'Pathways to Farming'[21] horticultural training component of Tyfu Dyfi. 12 producers were consulted, with the majority growing vegetables and smaller amounts of fruit, with 2 of the growers stating that they specialised in fruit, 1 in flowers.

Additionally, outside of the biosphere, but within easy reach of Aberystwyth or Machynlleth, there are a number of larger producers, many of whom already sell their produce to outlets within the biosphere. 6 of these producers who were closest to the Biosphere were contacted. Of these producers, 1 specialised in soft fruit, 1 in mushrooms, and 5 in vegetables and 1 operates a veg box scheme. A number of these producers were interested in selling through an online food hub.

[21] Pathways to Farming

Agroecological growing methods

Many of the primary producers are already demonstrating agroecological growing techniques in their methods of building and caring for the soil, growing without the use of agrochemicals, and planting and habitat creation for biodiversity and pest management.

Photo credit Einion's garden; Marigolds, tomatoes & chillis to repel soil nematodes and aphids[22]

Produce

Summary of produce grown within the Biosphere

A huge range and variety of produce is grown. Some 54 different vegetables and 4 types of fruit are grown for sale amongst the local producers, sold in various outlets. The bulk of local produce available is during the summer months, starting in May, until November.

[22] Einion's Garden

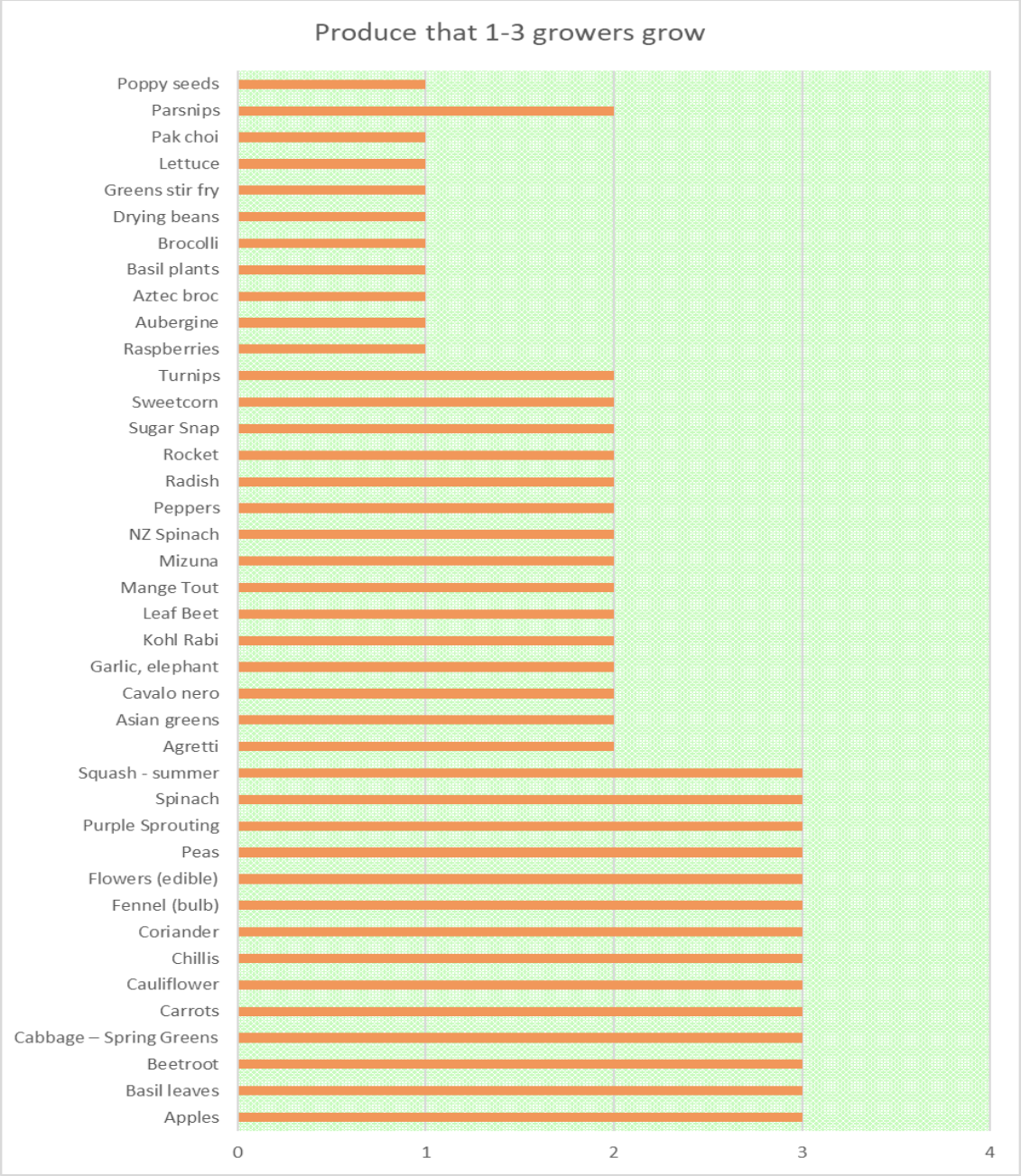


Figure 13: Produce that between 1 and 3 producers grow

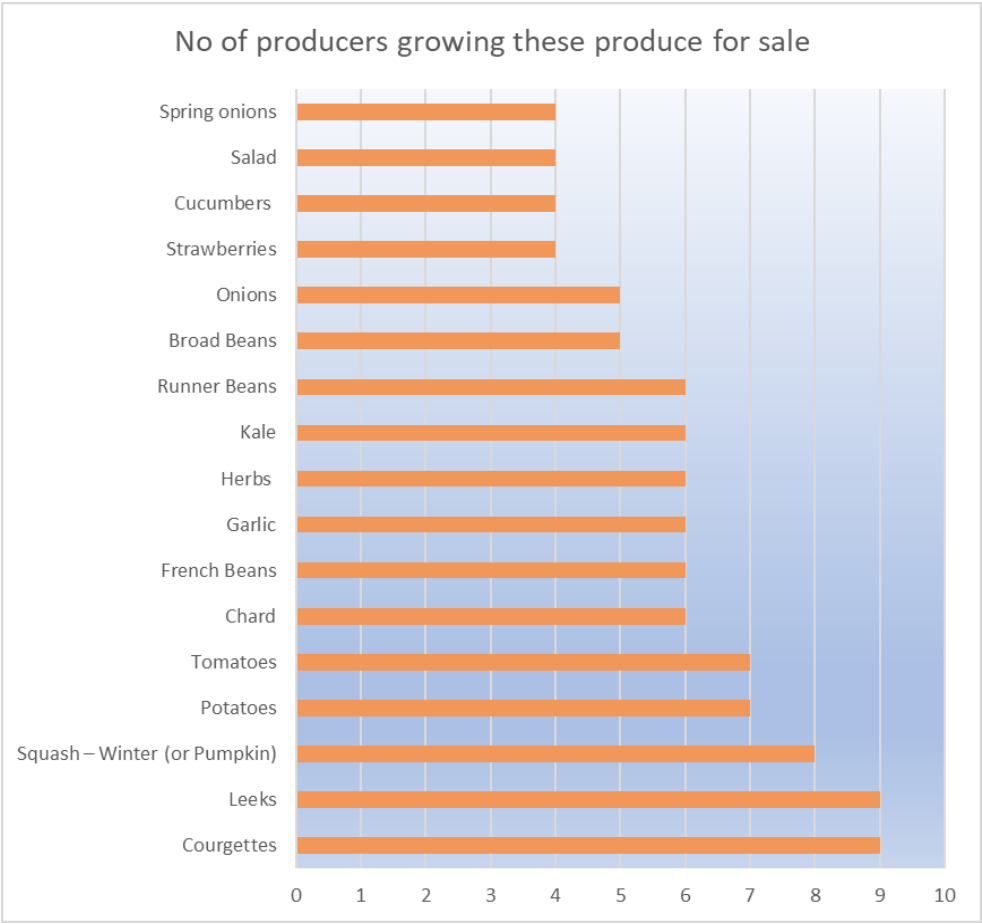


Figure 14: Produce that between 1 and 9 producers grow

Produce shortage

Outside of the main summer growing season, however, it was identified that there is a shortage of locally grown vegetables, in particular staples (such as potatoes, onions, carrots) and other produce. This means that produce has to be purchased from wholesalers further afield; where, for example, box schemes operate year-round.

To be able to supply the local area year-round, there is a need for more land availability for vegetable/fruit production and for these to be grown at field scale. With this there is also a need for storage and distribution facilities. It was also highlighted that a co-ordinated growing/crop plan for the biosphere would be beneficial although this comes with its own set of challenges.

Surplus produce

The larger market gardeners mainly have regular outlets for their produce, however in summer this inevitably there are periods of glut. In previous years, by approaching different outlets, a market can usually be found for this produce, however this can require additional time, effort and sometimes

expense to facilitate this. With some upscaling of production in 2022, the option of creating an additional sales outlet where produce has access to a larger population area was seen as attractive to some if it was easy to use, enabled producers to sell for a fair price, and had competitively priced fees.

Selling considerations

For the majority of producers, the price that could be realised for produce was the most important selling consideration, followed by ease and consistency of sale.

Vegetable production is notoriously low paid work with growers putting in long hours for relatively low return with many often struggling to earn even a basic minimum wage.

Figure 15: Veg producer most important selling considerations

Outlets for produce

It is acknowledged that the various outlets for buying and selling produce are valid and each has a place within the food system. No one size fits all. Many people enjoy the face-to-face interaction of buying at local shops and markets and being able to choose produce, whereas people with less time may prefer to shop online or a mix of methods. Each has their own niche within the local food system and in some cases one sales method can complement another.

Whilst a vibrant loyal customer base for locally grown vegetables/fruit in the biosphere already exists, within the wider population, there is a much larger proportion of people who purchase fruit and vegetables via conventional shops, supermarkets and via online supermarket deliveries. Miller et al (2021) in South Wales, have conducted some valuable research around Consumer types and profiles which may inform future work aiming to increase the uptake of local food.

Within the biosphere area, there are several outlets for getting locally grown vegetables to market with Machynlleth acting as a focal point. The bulk of producers supply to the local veg box scheme and sell additional produce at the local market.

Photos: Fresh & Local stall, Wednesday market, Machynlleth

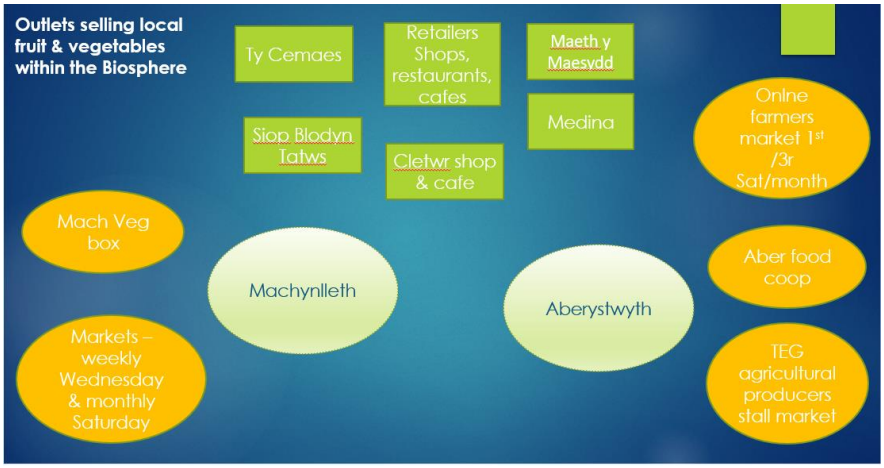
The town is well serviced with a veg box scheme (Mach Veg Box)[23], a Wednesday producer's market stall (Fresh & local)[24] a monthly stall outside COOP, and Mach Veg box local produce stall

Photo: Mach Veg box

Siop Blodyn Tatws[25]. A vegetable/fruit shop in Machynlleth with an online ordering facility

Within Aberystwyth, the largest outlets for agroecologically produced produce are the Aber Food Coop and the fortnightly Aberystwyth Farmers market where TEG, an agricultural co-operative has a stall and the bi monthly online farmer's market. The TEG group consists of 9 producers including meat, vegetables, dairy and secondary producers which has its own set of guiding standards in development (see appendix 4).

[23] Mach Veg box
[24] Fresh & Local
[25] Siop Blodyn Tatws



Branding

Blas Dyfi Taste

The brand 'Blas Dyfi Taste' was developed by Ecodyfi as a way of raising awareness of the value of local produce Biosphere focussed brand and of its links to good agricultural, horticultural and environmental practice. It is for use by both producers and for shops and cafes/restaurants. Members pay a small annual fee and sign up to a charter. 7 members are already signed up to this. See appendix 3.

During research for this report, it has been identified that there are different growing standards extant in the area and brands and that it would be valuable to revisit these to see what the similarities/differences are and where the similarities/differences lie and whether these could be harmonised.

Secondary producers

The aspiration of the project was to create an online food hub that also had a wider offer than just vegetables and fruit, to give more consumers choice, and encourage local enterprise including staples such as dairy, meat, flour and eggs. Such 'anchor products', can have the effect of attracting a more regular pattern of customer visits to the online shop.

Several secondary producers were consulted and expressed an interest in supplying a hub.

Retail businesses (shops/cafes/restaurants)

A small number of retailers who purchased through the Bwyd Dyfi Hub in 2020 were consulted. There was strong interest in purchasing more local wholesale produce through a hub if there was a good range and consistent amount of produce available. Consistency was a key consideration - wanting to be able to purchase a range of produce every week, year-round. Some retailers were prepared to pay

slightly more than wholesale prices for good quality local produce. Purchasing local produce through a wholesale hub was perceived as beneficial by some as it would save both time and therefore money, compared with ordering from multiple suppliers directly.

Through the consultation period, it became evident that although retailers were interested in purchasing local produce, at this current time within the Biosphere, due to a lack of larger scale growers, produce would need to continue to be sourced from outside of the Biosphere to be able to offer a sufficient volume and range of produce to be able to create a sustainable year-round wholesale hub. As more farmers are incentivised to move into horticulture as a result of the Sustainable Farming Scheme, a wholesale distribution hub with a larger distribution capacity will become more and more needed.

Food distribution

When thinking of the food system as it currently functions within the Biosphere, each producer makes deliveries, largely to more than one outlet and in many cases more than once per week, with a combination of both retail sales and sales to business. This has a cost in time, money and environmental impact. Below is a simplified illustration taking four producers as an example. Additionally, Aber Food Coop currently collects from multiple producers, spanning the biosphere (shown in red).

Figure 16 A part illustration of the distribution of produce by local producers to the different markets. The red line illustrates collections from producers by Aber food Coop.

There is potential for looking at how these enterprises can work together with a food hub, harnessing opportunities for shared transportation and distribution and potentially including other outlets such as secondary producers and food surplus outlets.

In Cambridge, Duncan Catchpole (2021) and his colleagues have created a Food hub[26] and a new way of thinking of our food system as a 'local food ecosystem', describing a business model which encompasses the entire supply chain from farm to consumer. This is a business-to-business model, aiming not for profit, but to feed people with healthy sustainably produced food; where *'everything finds a destination where it is valued and nothing goes to waste, with food being distributed more equitably throughout the community with a system that minimises the environmental impact of food'.*

In this model, businesses pay a sliding scale monthly fee to the hub according to their monthly spend for their goods. This in turn finances the co-ordination and distribution services offered by the hub. The Business benefit by receiving their goods at lower prices than they could themselves source the product, there is the benefit of ease of purchasing and access to wholesale produce at farm gate prices.

Primary and secondary producers can benefit from this and there are efficiencies in terms of resource use and wastage. Within this system, many of the aspects of the food system come under one 'food ecosystem'. This model requires a large physical space, for aggregation and distribution of items. Multiple business, primary and secondary as well as a veg box scheme, food surplus and composting schemes are part of the distribution cutting down on food miles. Although not directly transferable as a model from Cambridge to the Dyfi biosphere due to the Biosphere's considerably smaller population and demographic, there is some useful food for thought around how to collaborate and harmonise within different aspects of the food system to create an efficient distribution system which benefits many stakeholders.

[26] **Cambridge food hub** – improving connectivity between local food businesses and coordinating the food supply chain to achieve social and environmental benefits.

Feasibility of creating a food hub utilising the Open food network software

There was interest from over half of the producers within and just outside the Biosphere in selling through a food hub, subject to clarification around hub fees/costs and logistical issues. Producers identified advantages such as accessing new markets, transportation, creating networks of producers, raising awareness of the importance of local produce and being able to sell in bulk at times of glut. The perceived threats/barriers identified of selling through a hub including increased potential costs and logistics as well as how user friendly the OFN software would be to use.

Due to the scale of production, the majority of vegetable/fruit producers preferred the option of selling to a retail customer base. Expanding the range and geographical distribution area for the hub would potentially be feasible in future, subject to market conditions at that time. Data gathered though an online system will in turn be able to inform planting plans for growers. Markets currently not serviced for agroecological local produce could be opened up, such as Tywyn and Borth and rural areas more distant.

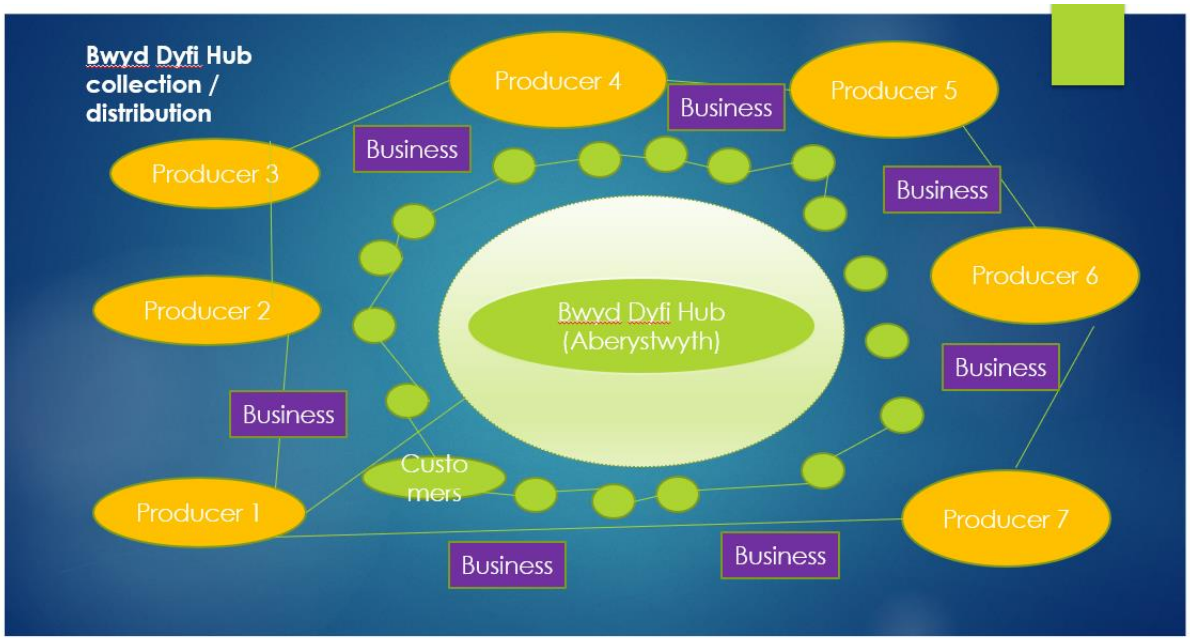


Figure 17 Diagram illustrating simplified potential collection route around local producers, delivery to retail customers (green dots) and potentially in future, wholesale produce to businesses

Location of the physical hub was a key consideration and finding suitable premises at an affordable rent for packing and distribution to allow multiple producers to offer their produce was a challenge.

Summary of key findings

- **Land in cultivation:** Only a tiny amount of land (less than 5 acres) is under horticultural production within the Dyfi Biosphere. This may change in future as a result of the Sustainable Farming Scheme where horticulture gets greater emphasis
- **Primary producers:** Within the biosphere, the majority of produce comes from a small group of market gardeners mainly based near Machynlleth with other producers located close to the Biosphere, also selling within the biosphere.
- **Larger scale production:** Staples such as (potatoes, onions, carrots) and winter produce need to be grown at a field scale to provide a year-round local supply to meet current and future demand. Currently this has to be purchased from organic wholesalers from further afield to meet demand. With an increase in production comes the need for more storage and aggregation.
- **Outlets for local produce:** There are a good range of outlets for local produce, however, there is still surplus at times of glut, increasingly with one market garden having expanded production in 2022. This takes additional time and resource to find markets, plus there are inefficiencies of selling to multiple outlets both for producers and for purchasers.
- **Future produce:** Three initiatives under the Tyfu Dyfi umbrella are aiming to increase food commercial production. The field scale trials which started in April 2022, the Pathways to Farming project, which started in September 2021 and a potential Community led agriculture project. All may in time yield additional produce which could find an outlet through a food hub, although this can't be relied upon for the current growing season. Additionally, the Sustainable Farming Scheme over the coming years is also likely to lead to an increase in vegetable production which will require sales outlets.
- **Premises:** Finding suitable premises to rent for a Food Hub food to enable multiple producers to be able to sell their produce, for aggregating and packing, close to where the current producers are located is a challenge, as affordable rental property is in short supply. Several food related enterprises located close to Machynlleth have expressed a need for a venue for packing and distribution.
- **Uptake of local produce:** Local produce uptake through the local box schemes Mach Veg Box and Aber Food Coop is good, collectively supplying around 130 households per week (variable by season). Both are aiming to increase their number of customers purchasing local produce which will in turn create space for additional growers to supply into the schemes.
- **Regenerative farming group:** Local Interest in regenerative agriculture is increasing with local initiatives such as TEG emerging.

- **Creating a food hub for retail customers:** With the largest centre of population in Aberystwyth, this is well placed to host a food hub with potential for expansion. Creating an online food hub using the OFN platform and delivering within the Aberystwyth is feasible. Premises, infrastructure and volunteer help are all available via Aber Food Coop and Aber Food Surplus to facilitate this. Additionally, Aber Food Surplus are moving to larger premises during 2022.
- **Creating a wholesale food hub**: The trial of the Bwyd Dyfi Hub was successful and demonstrated demand. However, to successfully run a wholesale hub year-round, attracting regular customers, a range of produce needs to be sourced from outside of the Biosphere. This again would also require sufficient sized premises to aggregate, pack and sort.
- **Distribution:** Many businesses are operating their own transportation systems which is inefficient and resource heavy. Implementing a shared transportation system, combining collections and deliveries within the Biosphere, could increase efficiency and reduce carbon emissions from transportation.
- **Opening up new markets:** There are areas within the Biosphere that do not currently have access to agroecological produce such as Aberdyfi, Tywyn, Borth, and many of the rural areas more distant from Machynlleth or Aberystwyth as well as seasonal tourist trade. With coordinated transportation, and integration between local produce and larger scale wholesale produce, the market could potentially be expanded to service these areas.
- **Agroecological & regenerative standards**: There are a few different enterprises with different ethics/ standards. To move forward with branding and standards, including the Blas Dyfi Taste brand, a review of them all comparing similarities and differences and seeing where these could be harmonised would be beneficial.
- **Access to land and funding** for infrastructure and funded training is a barrier to food production for new entrants to horticulture although new some new (match) funded schemes for new entrants and existing producers have been launched in 2022.
- **Combining purchasing power** - it may be possible to combine (across multiple enterprises) purchasing power to procure wholesale produce at favourable rates.

Implementation

Working within the Tyfu Dyfi project framework and funding plan the following phased approach has been agreed.

Phase 1

In stages:

Create a new Bwyd Dyfi online food hub utilising the OFN software.

- Creating an online retail food hub using the OFN is a first step towards opening up new markets for local primary and secondary produce, connecting buyers who prefer to shop online with the option of choosing produce from individual producers. There are good opportunities for collaboration between various stakeholders and opportunities for expansion as the markets increase and more growers and farmers enter the field of horticulture, incentivised under the Sustainable Farming Scheme. See Appendix 5 for Bwyd Dyfi Hub Vision
- Aber Food Coop will migrate their operations and customer base to the OFN and initially use their packing space, refrigeration facilities, team of volunteers and delivery drivers. Once this is achieved, more emphasis can be placed on diversifying the offer to include 'anchor' products such as bread, meat and dairy.

Note that governance of food hub development within the Biosphere will be subject to regular review. During the period of the Tyfu Dyfu project, Bwyd Dyfi Hub will be facilitated by Aber Food Surplus, in partnership with Mach Maethlon and Ecodyfi. Partners will collaborate to host quarterly steering group meetings. The Steering group will welcome all interested parties, and will inform and influence decisions through feedback, active listening and discussion. Steering group meetings will aim to support, challenge and communicate the Bwyd Dyfi Hubs vision and aims, and is where logistical reviews can be made - decision making processes can be developed and explored further.

Phase 2

Assuming phase 1 is successful, the next phase might, following further evaluation and consultation, time, funding and market conditions develop some of the following ideas:

- **Additional food hubs/distribution centre –** Creating additional food hub(s) across the Biosphere area, subject to finding suitable premises which could potentially incorporate different food related enterprises including Veg box packing, wholesale produce aggregation, and potentially house a food surplus scheme and a community kitchen.
- **Transportation -** Look into the feasibility of developing shared transportation within the biosphere to include other parts of the food system such other retailers and food surplus outlets
- **Wholesale produce** – Explore further the procurement of wholesale produce sourcing agroecological produce from as close to the Biosphere as possible
- **Geographical distribution area** - Consider expanding the geographical distribution area with satellite collection/drop of points according to local market conditions at the time

- **Standards –** Review and develop agroecological standards and resources and consider whether these can be harmonised
- **Purchasing** - Explore combined purchasing power to be able to purchase produce collectively on a larger scale

General conclusions

Putting the environment first, upskilling, diversifying, increasing the amount of food grown and traded locally, reducing GHG emissions, collaborating with one another, growing regeneratively in harmony with nature and within planetary boundaries are all more important than ever.

Local food production using agroecological growing methods is fundamental in addressing the multiple issues threatening food security at the present time. If we are to achieve a higher degree of food security, there needs to be better access to land. There needs to be investment, incentives, and support to increase the number of new growers entering food production; both with set up and ongoing costs as well as supporting landowners and farmers to diversify into fruit and vegetable production. There needs to be a focus on the value of local agroecological produce and growing methods, community involvement, awareness raising, education and training and exemplar projects to achieve and demonstrate this. Additionally, there needs to be easy means of selling through outlets that more closely connects producers with customers and offers both a fair price.

References

Lang 2020 Feeding Britain; our food problems and how to fix them

IPCC climate change 2022, Impacts, adaptation and vulnerability, Summary for policymakers

https://report.ipcc.ch/ar6wg2/pdf/IPCC_AR6_WGII_FinalDraft_FullReport.pdf

WRAP (2021) Delivering a 50% reduction in the GHG footprint of the UK

https://wrap.org.uk/sites/default/files/2021-10/WRAP-Pathway-2030-Delivering-a-50%25-reduction-in-the-GHG-footprint-of-UK-food-and-drink-summary-report_0.pdf

Hart (2021) of 'Supply Management' https://www.cips.org/supply-management/news/2021/january/impenetrable-brexit-paperwork-hits-food-supply-chain/

King et al (2021) Implications of COVID 19 for UK food supply resilience. Risk to food and nutrition security during and after the pandemic. https://www.chathamhouse.org/sites/default/files/2021-12/2021-12-02-covid-19-uk-food-supply-king-et-al.pdf

Watson & Pratt (2020-22) customer weekly email updates

The High Level Panel of Experts on Food Security and Nutrition (2017), Nutrition and food systems cited in King et al (2021) as above.

Food policy alliance Cymru manifesto (2021) FPACManifestoEnglish_091120.pdf (foodpolicyalliance.cymru)

Catchpole (2021) Local food ecosystems. How food hubs can help create more sustainable food systems.

Soil association (2022) https://www.soilassociation.org/causes-campaigns/a-ten-year-transition-to-agroecology/what-is-agroecology/

Sanderson et al (2020) A Welsh Food System Fit For Future Generations A report by the Sustainable Places Research Institute at Cardiff University, commissioned by WWF Cymru

2021 Feb MIXED FARMING – HISTORIES AND FUTURES, Chris Higgins https://www.dyfibiosphere.wales/_files/ugd/f2889b_627031b173784b1982d68d666a133f7e.pdf

Miller (2021) Feasibility Study on Sustainable Logistic Models of Food Distribution in South West Wales. A report commissioned by Ceredigion County council

List of figures

[27] OFN (2022)

Appendix 1 - Bwyd Dyfi hub food hub 2020 ethics & standards for vegetables & animal welfare

Ethics and Standards – Vegetables

In the case of **vegetable and fruit production**, Bwyd Dyfi Hub would like producers to adhere to the following standards;

- No chemical pesticides to be used. Pests should be treated with biological controls. Where biological controls fail, organic pesticides can be used.
- No chemical fertilisers to be used. Plant growth should be achieved through healthy soil and organic fertilisers where necessary.
- Food production must allow for wildlife habitat, e.g., sowing of flowers, leaving habitat space such as ponds, brash piles, and native flowering plants.

Ethics and Standards – Animal Products

What are we referring to when we talk about ecological and ethical food production in relation to **animal husbandry**? The Bwyd Dyfi Hub would like producers to aim for the below standards;

Animal

- Low stress handling and maintenance of animals in good body condition.
- Animals must have field access for as long as soil and climatic conditions allow.
- Barns used for overwintering should have natural light and adequate space and cleanliness.
- Aim to reduce use of antibiotics. Antibiotics may be used where necessary for animal welfare but they must not be used routinely nor as prophylactics.
- Use a local slaughterhouse to reduce miles travelled and animal stress.
- In the case of dairy, male calves should not be disposed of straight after birth for any reason other than irrecoverable illness or injury.
- In the case of poultry, birds must be free range.
- Reduce dependence on soy-based animal feed.
- In cases where chemical wormers or medication is used, follow appropriate veterinary recommendations regarding withdrawal periods.

Land

- Farms to respect and encourage biodiversity through land and pasture management. Cultivation of diverse swards, wild spaces and tree planting is encouraged.
- Reduction of chemical fertilisers in favour of planting legumes and altering grazing patterns of animals. Ideally farms will be working towards transitioning to chemical-free.

Appendix 2 - Stakeholder engagement:

Vegetable (& fruit) Producers within the biosphere

Name	Organisation
1.Ann & John Owen	Einion's gardens
2.Paul Bullen	Free range foods, Penegoes
3.Michael & Jo Mosse	Jo's Veg, Pennant
4.Kate Fenhalls	Melindwr Farm, Eglwysfach
5.Lynn Williams	Friddgate field, Friddgate
6.Annie Hooper	Cemmaes
7.Alistair Meikle	Llanbrynmair
8.Ruth Kernohan	Enfys Veg Pantperthog/Tal y bont
9.Jane Baker	Rye & Roses, Penegoes
10.Anne & Edward Jones	Cemmaes Road
11.Claire Rhydwen	Nature's basket
12. Grace Crabb	Grace Crabb & Co Flowers & potatoes/swede

Producers Consulted outside of the biosphere

Name	Organisation	Name	Organisation
Emma Maxwell	Ash & Elm horticulture[28], Llanidloes	Morganne Goodman	Madarch Co
Becca & Gareth	Ceredigion Salads, Llangwyrfon[29]		Pen las fruit farm
Cath Seymour	Seymour local veg, Llangwyrfon		Natntclyd Farm[30]

[28] **Ash & Elm horticulture**

[29] https://www.ceredigionsalads.com/

[30] Nantclyd Farm

BLAS DYFI TASTE
Charter

Biosffer Dyfi Biosphere
gwerth y byd - world class by nature

_____ promotes fresh and seasonal produce grown, reared or made in the Dyfi Biosphere area, and agrees with the Dyfi Biosphere's vision:

»*The Dyfi Biosphere will be recognised and respected internationally, nationally and locally for the diversity of its natural beauty, heritage and wildlife, and for its people's efforts to make a positive contribution to a more sustainable world. It will be a self confident, healthy, caring and bilingual community, supported by a strong locally-based economy.*«

Our use of the **Blas Dyfi Taste** brand makes us part of a network that supports the local food economy, increases awareness of locally grown produce, supports primary and secondary food producers and provides a good food destination for visitors.

We meet the 'criteria for participation' overleaf and will promote the brand as well as the food and drink.

To make our business and the area more sustainable, we will take the following actions:

We will review progress and sign the Charter again within three years, which is when our permission to use the logo on premises, packaging and promotional material lapses.

Name and signature on behalf of Business/Group:

_____

Date:_____

Name and signature on behalf of the UNESCO Dyfi Biosphere:

_____

Appendix 4 - Teg Regenerative Agriculture co-operative holistic context document (draft)

Teg is a Regenerative Agricultural Co-operative based in Ceredigion

"We are responsible for regenerating the environment i.e., ecosystems, soils macro/microclimate, by mimicking natural processes using scalable, profitable sustainable methods. What we do is based on holistics management and permaculture principles, and we share our findings for free"

Grwp cyhyrchwyr bwyd adfywiol Ceredigion Ceredigion regenerative food producers' group

Quality of life statement (ideas)

- Benefiting all through our work, contributing to local and global communities
- Aim to have fun in how we work and learn.*
- Strive for efficiency, but not be draconian about it.
- We believe that farmers can earn a decent living, from profitable forms of production, which don't harm the environment.
- We aim to be financially independent.
- We must respect ourselves, each other and local community.
- Make time for family and loved ones. *
- Share our knowledge, experience and support others for free whilst being transparent.
- Not being cultish about it

Têg holistic context/mission statement?

Who are we?

Têg is a self-regulated, self-help initiative for farmers in Ceredigion.

Statement of purpose

We are responsible for Regenerating the environment i.e., ecosystems, soils macro/microclimate etc. by mimicking natural processes using scalable, profitable, sustainable methods. Based on Holistic management and permaculture principals. We share our findings for free.

Production (philosophy / methods/ rules?)

- Farm using the five principles of soil health.
- Scalable production models.
- Build topsoil using plants and animals. Only using natural amendments and machines if they don't hamper soil life.
- Maximise photosynthesis and biology.
- -Restore water, carbon, and nutrient cycles.
- Create self-sustaining habitats.
- Have an open farm gate policy
- Demonstrate evidence-based outcome of our systems as well as anecdotal evidence.
- Champion local food resilience, giving people access to better food.
- minimise the need for capital.
- minimise the need for fossil fuels, championing renewable energy.
- Keep people up to date with the groups progress with social media, tours and being open and honest.
- Reassess holistic context as we progress.(yearly)
- Champion Family friendly farming.

Future resource base.

Behaviour and conduct.

- Commit to our holistic management context
- Low input-scalable based production.
- Not making the landscape worse.
- Satisfied and returning customers
- Good value products
- Good relationships with communities
- Competent workforce (clear instruction)
- Healthy working relationships
- Share experiences with anyone who wants to know.
- Clear contracts when collaborating
- Support/buy local.
- Open and honest.
- Sixty-mile input/output zone. Price structure is different for over sixty mile output.
- Stable network of customers.
- Demonstrate, replicable, scalable low-cost food production models.(to other farmers and customers)
- Brand name is clear and recognisable.

Future landscape.

- Build topsoil, increasing organic matter using the five soil health principles. Which are 1. Limit disturbance, 2. Armour soil-surface 3. Build diversity, 4. Keep living roots in the soil. 5. Integrate animals.
- Increase root mass and soil life.
- Capture and store water.
- Increase photosynthesis through holistic grazing and trees.
- Closed nutrient cycling.
- Areas for wildlife
- All farm foods created on farm
- Off grid
- A diverse income stream (to replace subsidies and grants).

Appendix 5: Bwyd Dyfi hub vision

We are working towards the Bwyd Dyfi Hub being a space where….

…nutritious and sustainably grown local food is bought and sold,
…community comes together to buy, grow, eat, share and enjoy food that makes them proud,
…food growing will contribute to harmonious natural environments in the beautiful Dyfi Biosphere,
…producers can sell fresh food to a wider audience that appreciates their local and sustainable commitment,
…we will raise awareness of the quality of local produce,
…people can try local food for the first time…and we can raise excitement and demand for local food,
…we will contribute to the reduction of food miles within the Dyfi Biosphere,
…producers will be fairly rewarded for their work, and sustainable food production will create a viable income and be enterprising for new food producers
…the food hub will becoming a thriving and sustainable social enterprise that unites food producers with a community that has a caring and collaborative approach to food sovereignty and security,
…through our community hub we will build greater connection between food producers and eaters, and build respect and curiosity around where food comes from,
…we will run the hub as an open, reflective and collaborative space, where feedback, change and ambition are encouraged,
…we are always learning, and we hope the hub can inspire new ideas and welcome innovation,
…Bwyd Dyfi Hub will start of in the home of Aber Food Surplus, with a dedicated Food Hub Officer, thriving volunteer team, and flourishing prospects of growing premises, and emerging collaboration with Mach Maethlon