



Heath and Hedgerow Sir Benfro Project (BC00003)

Evaluation Report

Summer 2023

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Project funding received from Welsh Government Rural Communities
Rural Development Programme



Table of Contents

Glossary.....	3
Terms.....	4
1. Executive Summary.....	5
2. Introduction.....	6
3. Context	7
3.1 Organisational context.....	7
3.2 Background information to the programme and project.....	7
3.2.1 CSCDS Focus Areas.....	8
3.3 Relevance to Welsh Government Strategies	9
3.3.1 The Well-being of Future Generations Act	10
3.3.2 Environment Act & Sustainable Management of Natural Resources.....	11
3.3.3 Social Enterprise.....	13
3.3.4 Net Zero Wales.....	14
3.3.5 Beyond Recycling: A strategy to make the circular economy in Wales a reality.....	15
3.4 Description and implementation of the project	16
4. Methodological approach.....	17
4.1 Feedback	17
4.2 Logic Model.....	17
4.3 Common Evaluation Questions.....	18
4.4 Case studies.....	19
4.5 Interviews.....	20
5. Financial and Indicator information.....	21
5.1 Finances.....	21
5.2 Indicators.....	21
6. Results of primary research.....	23
6.1 Training Events	23
6.1.1 Feedback from training.....	23
6.1.2 Feedback from training - Improvements and summary.....	27
6.1.3 Training event observations.....	29
6.2 Dissemination activities	29
6.3 Gwyl y Gwanwyn event.....	30
6.4 Frenni Fach.....	31
6.4 Network.....	34
7. Conclusions and Recommendations.....	36

7.1 Recommendations.....	36
List of Appendices.....	38

Glossary

Co-operation and Supply Chain Development Scheme (CSCDS)

Cwm Arian Renewable Energy (CARE)

Rural Development Programme (RDP)

Terms

Cooperation operation - the term used by the CSCDS to refer to a test or pilot project, new products or processes, essentially the activity that has been enabled through CSCDS funding and cooperating.

1. Executive Summary

Cwm Arian Renewable Energy's Heath and Hedgerow project team have exceeded most of the project outputs as outlined in their Co-operation and Supply Chain Development Scheme application. This is an excellent achievement, especially considering they had less time than originally anticipated to deliver the project.

There have been many constructive connections made and participant and attendee numbers at training events have been high. The project team responded to feedback from initial training events when programming subsequent training. Feedback has been extremely positive, along with requests for further training, demonstrating that the events are valued.

The project team made effective use of the budget and successfully recruited two additional team members mid-way through the project. These appointments expanded the team's knowledge, skills and professional networks which enhanced the project offer to stakeholders and training event participants.

Results from the arisings trials have demonstrated there is significant potential to create products for use on farms, smallholdings and in market gardens. Making local use of this biomass 'waste' has huge sustainability benefits - environmentally and economically.

Collaborative connections have been made which have led to cooperative working practices. The project team are to be commended especially given the innovative and experimental nature of this pilot project.

It has been the evaluators' pleasure to work alongside the project team, observing the project developments, attending project events, sites and meeting with the variety of people the project drew together. The following report details and evaluates the project activities and outcomes.

2. Introduction

Cwm Arian Renewable Energy (CARE) received project funding through the Welsh Government Rural Communities - Rural Development Programme 2014-2020 - Co-operation and Supply Chain Development Scheme (CSCDS), which was funded by the European Agricultural Fund for Rural Development and the Welsh Government. With this funding they launched their Heath and Hedgerow project in May 2022 and the project ran until June 2023.

Heath and Hedgerow was a pilot project which aimed to support land owners and managers to realise ecological and monetary value, as well as mitigating climate change, through managing biomass products and reducing waste. As set out in the funding application, the project piloted active management of hedgerows and heaths for the mutual outcomes of tangible/economic benefits, biodiversity preservation and enhancement, and climate change mitigation.

CARE commissioned Corinne Cariad to independently monitor and evaluate the Heath & Hedgerow project. The [Evaluation Guidance for Co-operation and Supply Chain Development Scheme Projects](#) was used to inform the evaluation structure and the contents.

The purpose of this final evaluation report is to review the activities and outcomes, identify if the project achieved the outcomes and based on this evidence to provide recommendations for the future. In addition, case studies have been carried out. They focus on the Frenni Fach common in north Pembrokeshire and use of the heathland 'arisings'. They are available in the Appendices.

3. Context

3.1 Organisational context

Cwm Arian Renewable Energy (CARE), based in North-East Pembrokeshire, began in 2007 as a community group before constituting as a Community Benefit Society in 2011. The constitutional aims of the organisation are; to create a low-carbon economy in their area; invest benefits in the locality; to prevent or relieve poverty; and, to evaluate their work so it can be replicated elsewhere.

CARE has a 700kW wind turbine generating clean energy in their area. The organisation also has an eco-friendly space for arts in the community and runs a number of local projects focusing on landscape restoration, rural enterprise support, community cohesion, renewable energy development and they provide an energy advice service.

3.2 Background information to the programme and project

The vision of the Cooperation and Supply Chain Development Scheme (CSCDS) is for businesses, organisations and communities to be working together to increase their resilience by tackling issues such as; rural poverty; financial sustainability; climate change and the Environment; in-work poverty and social exclusion.

Through their Growing Better Connections (GBC) project CARE identified a lack of facilities, equipment, cooperative working and knowledge in their geographical area relating to the heath and hedgerow part of the bio-economy. They identified the need for the pilot project to test potential ways of working and to provide necessary training to increase the skills base.

The Heath and Hedgerow project built upon the community connections of CARE and partnerships established by the GBC project. The GBC project evaluation has noted that CARE's ability to create community connections is very strong. Learning from related projects CARE have led, they identified that providing information is not sufficient to create change. Their prior work has demonstrated that it is their hands-on, cooperative and community-led approach that makes their work innovative and engages their community.

CARE's CSCDS application was made in relation to Measure 16.2 - Support for pilot projects and for the development of new products, practices, processes and technologies. CARE's Heath and Hedgerow project is a 'cooperation operation' in the

terms of the CSCDS. Cooperation operation is the term used by the CSCDS to refer to a test or pilot project, new products or processes, essentially the activity that has been enabled through CSCDS funding and cooperating.

In their funding application CARE described the project thus,

Heath and Hedgerow will pilot active management of hedgerows and heaths for the mutual outcomes of tangible/economic benefits, biodiversity preservation and enhancement, and climate change mitigation.

In more detail, the application proposed the following for the Heath and Hedgerow project:

To do this, we intend to create a **pilot** movement to **utilise biomass “waste”** from the heaths and hedgerows of Pembrokeshire. This will foster and **develop products, services and corresponding markets** that will harvest this “waste” and enable sustainable land management leading to protection and enhancement of these important assets.

We expect to **diversify and expand** businesses creating **shortened supply chains**, maximising **income for primary producers** via:

- biochar based products including, animal health feed supplements, soil and compost ameliorators, building materials and others combined with CCS [carbon capture and storage] trading
- biomass residues in energy generation
- animal bedding
- composting

3.2.1 CSCDS Focus Areas

Towards meeting the aims of the CSCDS, CARE identified that the Heath and Hedgerow project would contribute most towards the following focus areas;

Focus area 2

- The project has the potential to **enhance competitiveness of many types of agriculture** and **enhance farm viability**.

Focus area 5a

- The project promotes **resource efficiency** and supports the shift towards a low carbon and **climate resilient economy** in agriculture, food and forestry sectors.

Focus area 5b

- It will increase **efficiency of energy use** in agriculture and food processing.

Focus area 5c

- It facilitates the supply and use of **renewable sources of energy**, of **byproducts**, **wastes** and residues and of other non-food raw material, for the purposes of the **bio-economy**.

Focus area 5d

- It is believed that the project will **reduce nitrous oxide** and possibly **methane emissions** from agriculture.

Focus area 5e

- It will enable **carbon sequestration** in agriculture and forestry.

Focus area 6

- The project will promote **social inclusion, poverty reduction and economic development** in our rural area.

However, it should be noted that as this was a pilot project the ideas and project plan specified in the application was subsequently influenced by the project team and adapted to respond to the needs of stakeholders and beneficiaries as the project progressed.

3.3 Relevance to Welsh Government Strategies

Concerning Welsh Government strategies, the Heath and Hedgerow Project has made contributions in support of the following; The Well-being of Future Generations Act; Environment Act & Sustainable Management of Natural Resources; Social Enterprise; Net Zero Wales; and, Beyond Recycling. These will be considered in more detail here.

3.3.1 The Well-being of Future Generations Act



Figure 1: Well-being of Future Generations Act goals (Welsh Government)

The [Well-being of Future Generations Act](#) sets out the seven Wellbeing Goals (see Figure 1, above) and five Ways of Working (see Figure 2, below) for national government and Public Service Boards (PSB) which are made up of local government, local health boards and other specified public bodies. The [Pembrokeshire PSB](#) includes Heath and Hedgerow project stakeholders - Natural Resources Wales and Pembrokeshire Coast National Park Authority.

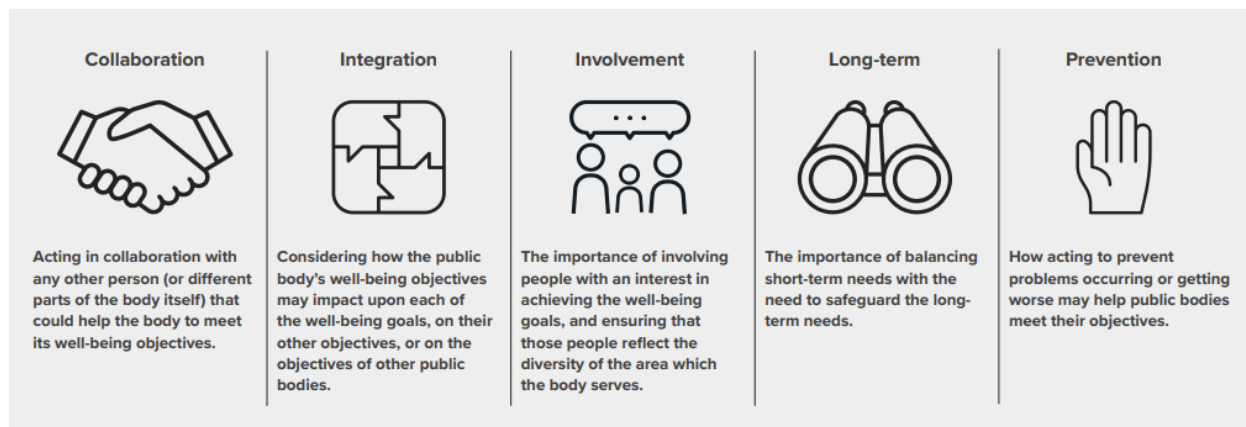


Figure 2: Wellbeing of Future Generations Act ways of working (Welsh Government)

In May 2022 Pembrokeshire PSB published its updated [Well-being Objectives](#), these are the key areas of focus in its Well-being Plan:

- Support growth, jobs and prosperity and enable the transition to a more sustainable and greener economy
- Work with our communities to reduce inequalities and improve well-being
- Promote and support initiatives to deliver decarbonisation, manage climate adaptation and tackle the nature emergency
- Enable safe, connected, resourceful and diverse communities

CARE's Heath and Hedgerow project has delivered towards all of these objectives and operates in keeping with the Well-being of Future Generations Act ways of working (see Figure 2, above). For example; involving and collaborating with other organisations and stakeholders to manage the Frenni Fach common; creating training opportunities based on the need of stakeholders; and, research and development for new products and processes which make use of previously wasted products. The project demonstrates that working with a local organisation can add value to the Pembrokeshire PSB to meet their objectives.

3.3.2 Environment Act & Sustainable Management of Natural Resources










Principles of sustainable management of natural resources		
	Adaptive management	manage adaptively by planning, monitoring, reviewing and where appropriate, changing action
	Scale	consider the appropriate spatial scale for action
	Collaboration and engagement	promote and engage in collaboration and cooperation
	Public Participation	make appropriate arrangements for public participation in decision-making
	Evidence	take account of all relevant evidence, and gather evidence in respect of uncertainties
	Multiple benefits	take account of the benefits and intrinsic value of natural resources and ecosystems
	Long term	take account of the short, medium and long term consequences of actions
	Preventative action	take action to prevent significant damage to ecosystems
	Building resilience	<p>take account of the resilience of ecosystems, in particular the following aspects:</p> <ul style="list-style-type: none"> (i) diversity between and within ecosystems; (ii) the connections between and within ecosystems; (iii) the scale of ecosystems; (iv) the condition of ecosystems (including their structure and functioning); (v) the adaptability of ecosystems

Figure 3: Principles of sustainable management of natural resources (Natural Resources Wales)

The [Environment Act](#) and Natural Resources Wales' (NRW) [Sustainable Management of Natural Resources](#) are closely connected to the Well-being of Future Generations Act. NRW's Sustainable management of natural resources is defined in the Environment Act as: "using natural resources in a way and at a rate that maintains and enhances the resilience of ecosystems and the benefits they provide. In doing so, meeting the needs

of present generations of people without compromising the ability of future generations to meet their needs, and contributing to the achievement of the well-being goals in the Well-being of Future Generations Act.”

The actions, co-operation operation and outcomes of CARE's Heath and Hedgerow project can be seen to have followed many of NRW's principles as outlined in Figure 3 (above), as is evidenced in this evaluation report.

3.3.3 Social Enterprise



Figure 5: The vision of the 'Transforming Wales Through Social Enterprise' report

Cwmpas' [Transforming Wales Through Social Enterprise](#) report 'was born out of collective process involving social enterprises and sector support bodies and has the support of Welsh Government'. The report sets out the vision of the sector from 2020-2030 and anticipates a growth in social enterprises in Wales.

CARE is a Community Benefit Society and the stakeholders they've engaged with

appear to meet the report's aim to;

...develop ethical alliances within a wider movement of socially responsible businesses and movements aiming to build democratic, sustainable and inclusive economies and tackle our climate emergency.

By using their influence to support new and growing enterprises through their Heath and Hedgerow project, CARE can be seen to be supporting the aims of the report and the work of Cwmpas.

3.3.4 Net Zero Wales

Team Wales
Tackling the climate emergency together

The **Team Wales approach** is where Welsh Government, public bodies, businesses and communities across Wales work together to tackle the shared challenges of the climate and nature emergency.

Work with Welsh Government and others to tackle the climate emergency

Involve others to build support and consensus across Wales

Join **Team Wales** by responding to one or more of the **CALLS TO ACTION** and/or making a pledge

Call 1 Engage with Welsh Government
Submit ideas and evidence directly to Welsh Government through consultations and events on policy development on the actions to tackle climate change.

Call 2 Encourage your networks
Encourage engagement within your workplace, local community and/or family, then make a commitment in our pledge campaign.

Call 3 Challenge others
Constructively challenge public bodies, businesses and civil society organisations to make commitments through our Pledge Campaign.

Call 4 Stay informed
Sign up to receive updates on engagement activity by emailing ClimateChange@gov.wales

MAKE A PLEDGE: Click here.
Here are some examples of pledges you can make.

For individuals...								
Choose to re-use plastics.	Drive less – and take public transport.	Buy local and avoid food waste.	Choose products which are deforestation free, or raise awareness of the impact of deforestation.	Buy clothes that last and repair them if needed, to extend their life.	Turn off lights when not in use.	Join or start a community group to help tackle climate change.	Plant trees or wildflowers in your garden or community.	Insulate your home and buy energy efficient products.
For organisations...								
Commit to Net Zero and publish an action plan.	Encourage low carbon vehicle use, active travel or more remote working.	Minimise waste.	Ensure that operations and supply chains are deforestation free.	Talk to your supply chain to ask how they are reducing their emissions.	Install or procure renewable energy.	Educate and engage people on climate change.	Plant trees on your land.	Increase energy efficiency of your buildings, vehicles and equipment.

See our Pledges and Case Studies in **Working together to reach Net Zero: All Wales Plan**

We will bring Team Wales together once a year for Wales Climate Week

By working together we can:

- Reach Net Zero in a fair way**
- Tackle global climate change and deforestation**
- Increase Wales' resilience to impacts of climate change**

Figure 6: Infographic for Welsh Government's Net Zero Wales strategy

[Net Zero Wales](#) is Welsh Government's second carbon budget, covering the period 2021-25, and looks ahead to the 2050 net zero carbon target. Their [Working Together to Reach Net Zero: All Wales Plan 2021-25](#) gives case studies and examples of pledges made by local authorities, businesses and third sector organisations to contribute towards the Net Zero plan for Wales. The work CARE has piloted in this project would be suitable to add to these (see page 58 of the Working Together document above). The CARE team may wish to do so formally as part of their dissemination activity.

3.3.5 Beyond Recycling: A strategy to make the circular economy in Wales a reality



Figure 7: Infographic for Welsh Government's Beyond Recycling strategy

The Welsh Government [Beyond Recycling](#) report identifies how we can improve our circular economy in Wales. CARE's Heath and Hedgerow co-operation operation pilots have effectively demonstrated potential uses for what have been considered waste products. By creating products which can be used locally they are also reducing transport costs, creating a local circular economy, which helps towards Net Zero emissions targets. Further, by working with a cross-section of their community and different organisations they are contributing to the Beyond Recycling aim to make resource efficiency part of Welsh culture.

3.4 Description and implementation of the project

With their co-operation operation CARE aimed, **'to support land owners and managers to realise ecological and monetary value, and mitigate climate change, through managing organic material (natural biodegradable matter or biomass) and "waste" products.'**

Heath and Hedgerow activities have been animated by the project's Cooperation Development Officers with additional services provided by external consultants and trainers. They did this by:

- Engaging with and supporting enterprises and other stakeholders
- Researching and identifying suitable equipment for biochar production
- Piloting activities for creating and utilising biomass
- Training events

Given the nature of the project, project activities were structured around the seasons of heathland and hedgerows. It is unfortunate that project funding was slower than anticipated. This meant that project activities were delivered in a shorter time-frame. Therefore, the impact of the project cannot be evaluated to see the changes over the, initially planned, longer time-frame. It should also be noted that building relationships with project stakeholders and beneficiaries could have been adversely impacted by this shorter timescale. However, the project team expertly built relationships quickly and overcame this potential barrier.

4. Methodological approach

Following on from the mid term evaluation report, this **final evaluation** report will consider the impact of the project, training and other activities. Recommendations are given throughout this report and collated in Section 7 as a list of recommendations for CARE's ongoing work in this area.

4.1 Feedback from training

The evaluator initially met with the Heath and Hedgerow project team in July 2022 to establish the evaluation approach and monitoring tools for the project. A **feedback form** was agreed for training events (see Appendices). These were reviewed in project team meetings with the evaluator and the data was considered in the mid-term report. The final data is analysed below in Section 6 - Results of primary research.

The aim of the feedback form was to identify:

- what participants enjoyed or didn't enjoy
- new skills or knowledge gained (and anticipated changes to business practices)
- if the training or event had impacted on how the participant valued organic waste products
- suggestions or comments

The feedback forms were compliant with GDPR. To enable the evaluation process, an option could be included for respondents to give explicit consent for the evaluator to contact them. Little demographic data was collected, which limits the evaluation of the demographic reach of the project activities (e.g. gender, age, experience, location of training course participants). The evaluator recommends that CARE collect demographic data in future iterations.

4.2 Logic Model

A **Logic Model** was developed by the evaluator with detail drawn from the funding application, the project team's initial project planning documents and in discussion with the project team. The Heath and Hedgerow Logic Model below (Figure 8) was agreed by the project team.

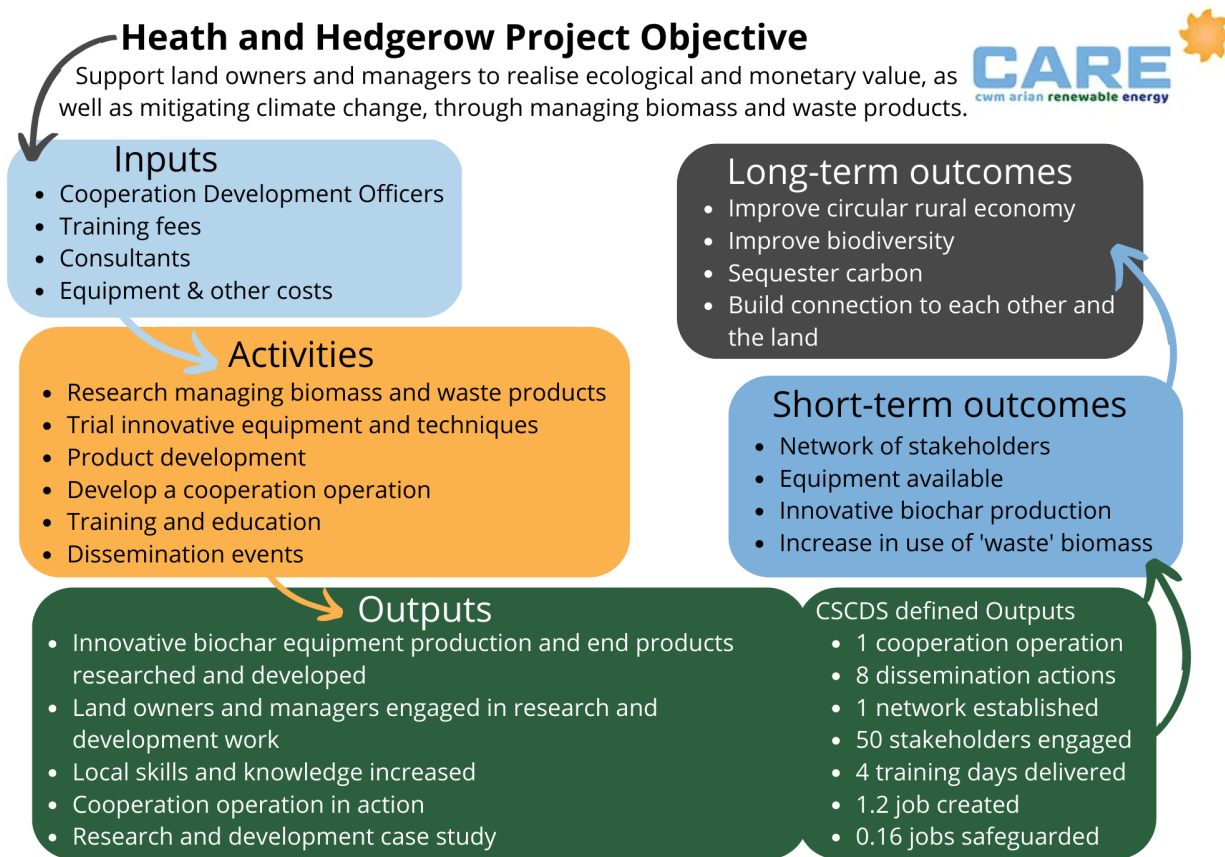


Figure 8: Heath and Hedgerow project Logic Model

A Logic Model was chosen as the structure to guide the evaluation process, as recommended in the [Evaluation Guidance for Co-operation and Supply Chain Development Scheme Projects](#). The Logic Model helped provide the structure for the evaluation process.

4.3 Common Evaluation Questions

Another recommendation in the Evaluation Guidance document is to identify and respond to [Common Evaluation Questions \(CEQs\)](#) as, 'They help define the focus of evaluations and allow for examination of the progress, impact, and achievements of rural development interventions at various scales including Wales, the UK and other EU Member States.'

In consultation with the project team the following CEQ was selected for the evaluation process:

- P1A - Q1 - To what extent have RDP interventions supported innovation,

cooperation and the development of the knowledge base in rural areas?

As can be seen in Table 1 below (based on the [CEQ Working Paper](#)), the CEQs are to gather information at a country level for comparison across the EU. The project indicator data provided by the project team to the funders, and analysed here in 'Section 6 - Results of primary research', provide the necessary evidence that the Heath and Hedgerow project has satisfied the Judgement Criteria.

	Focus Area - Fostering innovation, cooperation, and the development of the knowledge base in rural areas
Focus Area related Common Evaluation Question	To what extent have RDP interventions supported innovation, cooperation and the development of the knowledge base in rural areas?
Judgement Criteria	<ul style="list-style-type: none"> • RDP projects have been innovative and based on developed knowledge • Operational groups have been created • Variety* of partners involved in (European Innovation Partnership) EIP operational groups • Innovative actions have been implemented and disseminated by the EIP operational groups
Common Rural Development Indicators	% of expenditure under Articles 14,15 and 35 of Regulation (EU) No 1305/2013 in relation to the total expenditure for the RDP (FA 1A - Target indicator)
Additional Information	<ul style="list-style-type: none"> • % of innovative projects out of all RDP supported projects • Number and types of partners involved in cooperation projects • Number of supported innovative actions implemented and disseminated by EIP operational groups

**Variety is defined by the representation of different socio-economic sectors (private, public, civil, agriculture, food industry, forestry, etc.) and organizations such as academia, banks, NGO, etc*

Table 1: Common Evaluation Question Guidance for Focus Area P1A - Q1

4.4 Case studies

To gain deeper understanding of how and why the project has had an impact in-depth interviews by the evaluator have been carried out, leading to a **case study of the Frenni**

Fach common initiative. Further in-depth interviews were conducted by the project team, they produced **case studies of those using the heathland arisings** and **a case study of the biochar activities**. The case studies focused on people and organisations which have engaged deeply, or on numerous occasions, to provide rich data covering multiple aspects of the project (see Appendices).

4.5 Interviews

End of project interviews were conducted with key people involved with the project, for example the Cooperation Development Officers, consultants, participants of training events and relevant stakeholders. These interviews gave deeper insight into what respondents thought had been important with the project; the behaviour and attitudes of participants; and allowed for more flexibility and depth of questioning than the feedback surveys provided.

5. Financial and Indicator information

5.1 Finances

The budget was regularly monitored by the project team and reported to the CARE board of directors bi-monthly (sometimes monthly) and to the funders. The organisation had sufficient cash-flow to meet project costs and funding was claimed retrospectively.

The funds have been well managed and all funds have been suitably allocated. As this was a pilot project, projected costs from the initial application can be expected to have changed. Significantly, a member of staff stepped down after a few months (to concentrate on other work within the organisation) and recruiting suitable new members of staff took a few months.

The reduction in staff time to carry out the project could have had an impact on the budget spend and the project indicators. The project team have ably managed the staffing issues and delivered the project as planned, revising their schedule in some instances.

5.2 Indicators

The project team kept records up to date and have recorded all feedback in detail. As can be seen in the Summary of Progress Against Indicators in Table 2, except establishing a network, they have met all project indicators and exceeded the majority of them.

Indicator	Target	Progress	% achieved
Cooperation operation supported	1	1	100%
Dissemination Actions	8	9	113%
Networks established	1	0	0%
Stakeholders engaged	50	76	152%
Training days held	4	9.26	232%
Jobs created	1.2	1.2	100%
Jobs safeguarded	0.16	0.21	133%

Table 2: Summary of Progress Against Indicators

Work has started towards creating two potential networks for stakeholders. One is for stakeholders interested in working together to share equipment for harvesting and

processing heath and hedgerow arisings. Another is for stakeholders interested in working together on biochar production and sales. However no network has been fully established in the project time. CARE plan to continue developing this aspect of their work and anticipate meeting this indicator given more time. For further details see 6.4 Network, below.

The indicators met is a fantastic achievement which is a credit to the project team's curiosity in this emerging field and the significant work they have done to collaborate and cooperate with stakeholders. The new team members recruited for the second half of the project brought additional skills, experience and contacts which expanded the offer and technical assistance the team could make to stakeholders. As well as to creating training, events and activities which met the project plan and also appealed to participants.

Further details of how the indicators were met is detailed in section 6 - Results of Primary Research, below.

6. Results of primary research

In addition to the indicator data collected and documented in Table 2 (above) further primary research has been conducted.

6.1 Training Events

The project team facilitated the delivery of 16 training events (of varying duration), which totals 9.26 training days (with each day defined as 8 hours of training). They more than doubled their target of 4 training days.

Training events focused on farm-scale techniques for; using a Kon Tiki biochar kiln, making biochar, use of bracken on farms, use of biochar on farms, inoculated composting, vermicomposting, bokashi composting and practical wood chipper and chainsaw training.

6.1.1 Feedback from training

Feedback forms from **training events** have had a high response rate with 75 of 113 participants completing feedback forms. Over half of the training events had a 100% response rate, others had a high response rate and for three events one or none were completed.

It would be useful to understand why some people didn't complete the feedback form and consider how responses could be captured from those not completing the feedback form. Where no feedback forms were completed it could be that they weren't issued to participants.

The feedback was overwhelmingly positive with **the majority of respondents agreeing** that,

- they enjoyed the training event (*average score 4.4/5 or above*)
- it helped them build their skills, knowledge or networks (*100%*)
- it helped them to value the importance/potential of organic waste (*91%*)
- they had gained new skills or knowledge (*with examples given, see below*)
- they might use whatever they gained at the training event in future (*with examples given, see below*)



Inoculated Composting Workshop - 16th September 2022

The additional comments given by participants are glowing and indicate that the training events meet expectations. More importantly, for the legacy of the project, participants anticipated using their new knowledge and skills. Below are some examples to illustrate how the project supported participants, in their own words.

How do you feel the event helped you build your skills, knowledge or networks?

"Networking with neighbours to share resources. Learnt more about composting."

"Inspired an interest in microbiology."

"I know what to do now and how amazing crops grow when using lab [lab is a lactobacillus soil improver]."

"Lots of new skills, practical experience & fab connections."

"Good introduction to whole subject of biochar. Good to visit another community."

"I've learnt which waste products can be used for biochar & compost & how to make it."

"Very informative demonstration from knowledgeable person."

"Understand bracken life cycle; multiple uses; local projects & what CARE is doing (H&H etc); mulch compost."

"Being able to see what I've read about was useful and excellent speakers."

"Widened my view of different methods."

"Understanding difference between worm compost and other [composting techniques], benefits, how to maintain a wormery and make quality compost. Good to make connections with other interested local people."

"Understanding reasons for making biochar, how to make it, how to inoculate it, where/when/how to use it. Connections to others interested. Making soil amendments. Making charged biochar potting compost."

"Deeper understanding of bokashi and other processes. Figure out what was going wrong with my bokashi to ferment food waste successfully! Also saw first hand some new growing techniques."

How do you think you will use the knowledge / skills learnt today, in the future?

"To improve soil health and to increase production on our market garden."

"Making biochar out of brash & hay."

"Def. apply to the farm - making me rethink our winter housing."

"Immediately at home on the farm & in my future courses with others."

"I feel more confident to do it on my land and understand the process better (especially the grass)."

"Hope to hire the Kon Tiki to make biochar on our own land."

"I hope to use heathland cuttings for biochar or animal bedding or compost."

"Make more use of bracken as mulch & animal bedding."



Soil health training - 30th April 2023.

"New project perhaps & improving own composting systems."

"On our land and woodland and to promote use of sequestering carbon in soil."

"They [biochar and inoculation recipes] will help on the farm - increasing productivity and soil health."

"I'll make bokashi for food waste. I have already mulched heavily with hay which has been invaluable this year. And ... I am already using the contacts above for a local project."

"Onsite at my farm to help me manage growing better and also manage food waste to bring fertility back into the system."

"We are already looking at utilising this new [composting] knowledge in our vineyard and have earthed up my potatoes with hay."

"I will allow more wild plants into my growing system as I understand better the benefits this brings and improve my composting method."

How has this event helped you to value the importance/potential of organic waste?

"I learned everything has many uses."

"Already do, but this has expanded my understanding."

"Great to see how all our waste can be such a resource to cycle back in the soil."

"Better understanding benefits of biochar as an alternative use for brash which would otherwise be burnt or rot."

"How nothing is waste and all useable and free nutrients."

"Change my definition of what waste is. Everything has a use."

"New uses for woody and other organic materials."

"It's not waste until it's wasted!"



Biochar Demonstration Day - November 30th 2022

"Very simple effective way to convert horse manure and valuable product [by vermicomposting]. Potentially transferable to other waste."

"I learnt about the nutrients all around me in nature and how to incorporate it to bring my garden to a good balance."

"It especially helped me understand how to get more value out of food waste."

"Use of hay, including hay that can't be used for animal feed, and use of cooked waste and weed waste in bokashi systems."

"Just enhancing what I already knew about composting but helping me understand quicker more efficient ways of doing it."

"The value of the soil microbes too."

"I think I already valued it! However, I think it has shown further uses and value but demonstrating more unusual ways of using organic waste [Bokashi composting]."

6.1.2 Feedback from training - Improvements and summary

A few suggestions were made in response to, '**Is there anything you would improve?**' Most notable were requests for additional training, for example, "Maybe a talk or information about the different uses/potential of biochar". Some participants also

wanted more hands on experience.

This feedback was addressed in the next training event which was specifically a hands on workshop on the practical applications of biochar with Peni Ediker (who was subsequently employed as one of the new Cooperation Development Officers).

One biochar demonstration was on a cold day, "unavoidable at this time of year", and this was commented on by most respondents. In future, if inclement weather is forecast consider reminding participants of the outdoor nature of the training event. Alternatively, use an indoor venue for parts of training events, where the training allows (may not be possible e.g. burning biochar, scything), and if a suitable venue is available nearby.

Conversely, some biochar demonstrations happened, or were scheduled, during an extremely hot and dry period in May and June. This led to concerns from the project team about safety - for themselves and participants as well as being fire risk at the venues. Some planned demonstrations were postponed, or the venue was changed, as a result.

From the feedback form comments it is apparent that some training event participants were interested in domestic application of the processes and knowledge, rather than for enterprise or large scale. This is to be expected as the training events were intentionally open to anyone. However, the processes being demonstrated were designed for farm-scale, small-holdings and market gardens.

Some feedback respondents also commented that they would be interested in hiring equipment which could make them customers for an equipment hire cooperation or enterprise. This demonstrates a tangible benefit of welcoming a diversity of participants onto the training events. Less tangible is the networking, which many respondents commented positively about. This was clearly valued by training event participants and



Biochar demonstration workshop



Biochar produced from green waste products.

enabling cooperation and connections was central to the aims of the Heath and Hedgerow project.



Inoculated composting workshop, 16th September 2022.

6.1.3 Training event observations

The evaluator booked onto and attended various training events and made the following observations:

- Events were advertised directly to project stakeholders and then via CARE's website, Facebook page, newsletter and Whatsapp groups and flyers were produced for some events.
- The booking process was straightforward and easy to do for those who are used to booking events via websites.
- Online promotion and booking could potentially have been a barrier for people who don't use or have online access. However, there is no data about this either way.
- Course tutors were evidently experts in their field and responded to questions as they arose with detailed answers or advice about where to seek further information.
- Practical, hands-on training was very well-received and the sessions attended were well paced with sufficient time and resources for all participants to engage.

6.2 Dissemination activities

The dissemination activities (actions undertaken to raise awareness of, and promote, the project) were effective in attracting people to attend training events. This was evidenced by the high uptake of places at most training events. As well as attracting participants for other support offered by the project e.g. advice for pilot activities. For example, providing expertise on bokashi composting to Coleg Plas Dwbl to support their trial to compost heathland arisings.

Dissemination activities at project launch helped to shape the training events offered, in response to the needs of stakeholders. Landowners were consulted and in response the team put on training events linked to these themes e.g how to manage bracken and productive uses for it and hot composting. The dissemination activities promoted training events accurately which is reflected in the positive feedback from respondents.

The **demographic reach** of training events was discussed with the project team. This data was not formally collected however the project team were able to elaborate on some demographics. The majority of participants at training events were new or relatively new entrant farmers, land owners and managers. They are also mainly incomers to the area, rather than long-term residents. A suggestion was made that they are attracted to the training as they don't have established networks or knowledge and are keen to develop these. Whereas more established members of the community and experienced farmers, land owners and managers are less likely to seek training as they already have strong networks and depth of knowledge.

However the project's work on the Frenni Fach and subsequent trials included collaborations with established organisations and long-term residents and businesses. This aspect of the project built upon previous work done by CARE. Suggesting that a broader demographic reach may take longer to establish and maybe more achievable for more in-depth collaborative work than training events alone.

6.3 Gwyl y Gwanwyn event

The evaluator attended the **Gwyl y Gwanwyn** event which was held at various venues in Hermon in late April. This event was a collaboration between CARE's Fruit and Bounty and Heath and Hedgerow project teams. When planning, the project teams wanted to, 'pool resources and celebrate the crossovers between these related areas'. The joint event focused on soil, compost, biochar, fruit trees and fruit production.

Gwyl y Gwanwyn had a festival feel with stallholders offering activities, information on local organisations as well as stalls selling related products, food and drink. CARE had

organised a variety of workshops with expert speakers from the local area as well as further afield.

There were 14 workshops plus other activities, some indoors, some outdoors, some presentation-style, some practical, some panel discussion. Some workshops were suitable for all ages, some for children, some for adults. Some were for beginners and others were for those with some prior knowledge and experience.

The event sold out very quickly, and additional tickets released also sold out, indicating high demand and a programme which was of interest. The project teams were supported by 30 event volunteers, another indicator of interest and support.

Feedback received from CARE staff, workshop speakers and stallholders was that the event was well organised on the whole, the programme was interesting and there was a mix of ages. Recommendations were mostly about practicalities such as improved signage, issues with queuing for food and a suggestion of fewer workshops on at a time so there's less choice (and less to miss) and instead to hold the event and workshops over a longer time period.

6.4 Frenni Fach

CARE, through their Growing Better Connections project, have been involved with the Frenni Fach common for the past few years. In January 2022 they commissioned a Management Plan in collaboration with the Frenni Fach Graziers Association. The Heath and Hedgerow project has developed this work further.

The experimental use of "waste" biomass arisings from the Frenni Fach common, between the villages of Tegryn and Bwlch y Groes, was a significant aspect of this project. Firebreaks were cut in the autumn to manage risk of damage to property. The 'arisings', or cut materials, were removed, 'to avoid build up of fertility, which favours the growth of specific species with less ecological value'.



Cutting firebreaks on the Frenni Fach.

This work was carried out in collaboration with the Pembrokeshire Coast National Park Authority (PCNPA) and the Frenni Fach Graziers Association who have connections

with the common land. Posters were displayed at the site to inform Frenni Fach users of the activities and the benefits to the area of the project work (see Appendices). In depth evaluation interviews with staff from Pembrokeshire Nature Partnership and PCNPA indicate appropriate engagement has taken place from the beginning, strong relationships have been established and there was support for the way the project team and CARE have collaborated with all involved.

Five farmers and land owners were interested in running trials with the arisings on their sites. Activities were monitored by the project team and documented via Arising Monitoring Forms (see Appendices). The participating organisations are all involved in commercial growing or farming in a variety of ways (some do more than one of the following):

- market garden
- agroforestry
- permaculture farm
- biodynamic farm
- conventional livestock farm.

They planned to trial using the arisings in a variety of ways:

- hot composting
- composting
- bokashi composting
- mulching fruit trees
- mulching an area of land which will be the future site of a tree nursery bed.

Due to very wet weather conditions, two sites did not receive the arisings and the planned bokashi composting has not happened yet. However, one site is planning to do this at a later date.

Two sites reported that some or all of the arisings were larger or coarser than expected and raised concerns that they may not be suitable for composting (the planned process). One site commented that they would not have accepted the arisings had they known this would be the case. At the time of writing, the composting process is ongoing at these sites and so the final results are still unknown. Learning that the first cut of arisings are likely to include some larger pieces will be useful for future iterations of this work. For future iterations it could help to; ensure ongoing communication between the project team and the sites about the the arisings, to manage expectations; and, if

possible, flail harvest arisings down to suitable sizes for the next process (e.g. composting or biochar).



Inspecting the newly cut firebreaks (left), and firebreaks 7 months later (right).

The external evaluator and the project team conducted in depth interviews with Frenni Fach stakeholders and trial sites and have compiled four case studies (see Appendices):

- Frenni Fach Case Study
- Patch of the Planet Case Study
- Pantirion Farm Case Study
- Biochar Case Study

The in-depth interviews with stakeholders and trial sites indicate that there is interest in future iterations to cut and remove arisings for on site use. Arisings have been successfully used to create biochar and as a mulch. Composting trials are ongoing with plans to improve the process in future iterations. CARE will continue to work closely with at least one site, the conventional livestock farm (Pantirion Farm), to continue trials of these processes.

Stakeholders from PCNPA have commented that the trial on Frenni Fach could lead to similar work in other areas of heathland as a land management practice. The use of arisings to establish an enterprise is an ongoing piece of work.

Alongside the practical activities on the Frenni Fach, on-site trials and training events, the project team have been exploring plans for an enterprise/enterprises to create products from the arisings which could be sold commercially. They have established

links with experts in animal bedding, bio-char and bracken briquettes. This work is ongoing and will be continued by CARE.



Making compost with heathland arisings at Pantirion Farm.

6.4 Network

The groundwork for establishing a network has begun. The project team identified an interest from stakeholders in coming together to share equipment, skills, knowledge and resources.

For some stakeholders, purchasing and storing large equipment is beyond their capacity. The project team identified a Library of Things as a potential solution and conducted research and established connections to explore this further. They found there is already a Library of Things in Pembrokeshire (part of Pembrokeshire County Council) which hires out domestic equipment, including gardening equipment. The project team explored the possibility of a collaboration with the existing Library of Things. It was mutually agreed not to pursue this option.

They found constraints to hiring out equipment:

- Operators must have received training to be covered by insurance.
- The equipment is large and heavy (as it is farm-scale rather than domestic-scale)

and requires a van or trailer to move it.

These constraints would make hire costs expensive and requiring pre-hire training would make a hire service impractical. The project team began exploring other options and this work will be continued by CARE.

An informal network of people interested in biochar has been drawn together by the project team. Some are interested in coming together to collaborate around biochar production and sales. If established this would be a cooperation operation and, depending on the structure, may also be a network. This work will be continued by CARE.

7. Conclusions and Recommendations

CARE's Heath and Hedgerow project met all but one of the indicators and exceeded many of the initial targets. The training events and initiatives generated by the project team were well attended and received by participants and stakeholders. As evidenced in the numbers attending, feedback given and in-depth interviews. This indicates a well managed project which met the needs of the participants and stakeholders.

There is interest from participants and stakeholders for CARE to continue collaborating on the management of the Frenni Fach and potentially expanding this to similar heathland areas. The initial trials for use of the arisings have demonstrated that there is potential for creating products commercially. CARE plan to conduct further trails and to continue working with stakeholders to achieve this potential.

The project team have created interest in novel management practices and processes - harvesting heath and hedgerow arisings, creating biochar, inoculating biochar, and various composting processes. They have engaged numerous participants and stakeholders in the activities, trials and training events. They have laid the groundwork for a strong legacy from this project to develop two enterprises, which have received seed funding, and possibly two networks from their cooperation operation.

7.1 Recommendations

The following recommendations are for the project team's consideration and it is not expected they will all be acted upon. These recommendations may be helpful in considering future iterations of this work.

- Collect demographic data (e.g. gender, age, new entrant, established, location) to reflect on the reach of the project e.g. on booking or feedback forms.
- Collect data about how participants heard about training events to review the effectiveness of publicity and promotion e.g. on booking or feedback forms.
- Consider why some participants did not complete feedback forms at training events and how this could be improved in future. Potentially consider alternative methods for capturing feedback e.g. there may be barriers for some people so could ask for verbal feedback or someone else completing the form on their behalf.

- Consider if there could be barriers for more established farmers, landowners and managers being involved. It is recommended that connection is made via established links to enquire what, if anything, is a barrier, e.g. dissemination, training event subject matter, delivery of training events in Welsh.
- Consider if there are alternative ways of disseminating information to reach into communities not already connected with, e.g. established networks like the NFU and YFC, Farming Connect.
- Explore potential ways of continuing to deliver training events, e.g. apply for funding, explore commercial viability of running training events.
- Add a pledge to [Working Together to Reach Net Zero: All Wales Plan 2021-25](#) [[Gweithio Gyda'n Gilydd i Gyrraedd Sero Net: Cynllun Cymru Gyfan 2021-25](#)] to feature alongside local authorities, businesses and third sector organisations contributing towards the Net Zero plan for Wales (see page 58 of the Working Together document above).
- Re. Arisings trials: For future iterations it could help to; ensure ongoing communication between the project team and the sites about the the arisings, to manage expectations; and, if possible, flail harvest arisings down to suitable sizes for the next process (e.g. composting or biochar).

List of Appendices

This list relates to the Appendices which are available separately.

Appendix 1: Training feedback form

Appendix 2: Poster for Frenni Fach [Heathland - Frenni Fach]

Appendix 3: Arisings monitoring forms [Heathland - Frenni Fach > Use of arisings]

Appendix 4: Frenni Fach Case Study

Appendix 5: Patch of the Planet Case Study

Appendix 6: Pantirion Case Study

Appendix 7: Biochar Case Study