



The Carbon Classroom

CCF no. 2577

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Executive summary

In July 2013 Transition Turriefield was awarded £38,433.15 by the Climate Challenge Fund to develop and run the Carbon Classroom project. Based in the far west mainland of the Shetland Isles the project aimed to reduce individual and community carbon footprints by increasing the quantity of locally grown food and vegetables and reduce food waste. The project's outcomes were to:

- Reduce the carbon emissions from food consumption in the west side of Shetland by at least 489 tonnes CO₂e

To do this we intended to:

- Increase the number of households growing their own food in the west side of Shetland by at least 60; decreasing CO₂ emissions by at least 7.13 tonnes CO₂e
- Reduce reliance on fresh produce imported to Shetland in at least 100 households by at least 10%; decreasing CO₂ emissions by at least 308 tonnes CO₂e
- Reduce the amount of wasted food in at least 120 households across the west side of Shetland; decreasing CO₂ emissions by at least 183 tonnes CO₂e
- Increased awareness and engagement of at least 400 members of the community in a low carbon future
- Increased use of recycled goods by at least 50 individuals

The idea for 'the Carbon Classroom' and a bid to the Climate Challenge Fund was born out of a desire to see positive change for our community. Designed to be a source of information advice and learning, the Carbon Classroom has run workshops, courses, open days and local food events; provided information, advice and support to: 'grow your own', reduce food waste, make better buying choices and start composting. The project has involved 35 volunteers and engaged with more than 901 individuals, including 9 schools. Overall the Carbon Classroom has worked with Shetland residents to grow food on 3755m² of land and divert 7.636tonnes of waste from landfill.

Our outcomes have had mixed success. The targets for engagement and growing have greatly exceeded expectations; total engagement has more than doubled and achieved 3.5 times the intended home grown food production with the resulting CO₂e reduction estimated to be 25.91tonnes over a ten year lifetime. Targets linked to behaviour change proved more difficult to gain enough evidence which would give a realistic picture of CO₂e reductions. Participants were reluctant to respond or supply enough detail to enable us to demonstrate the full impact of our intervention. Evidence gathered represented a reduction in imported food and food waste which has been calculated to be 95.6 tonnes and 26.72 tonnes Co₂e respectively over a 10 year lifetime. Where information was available it indicated a level of change which we have considered positive and, if representative of the majority of those we had contact with, suggests the project has made a significant impact in at least raising awareness and highlighting the need for change.

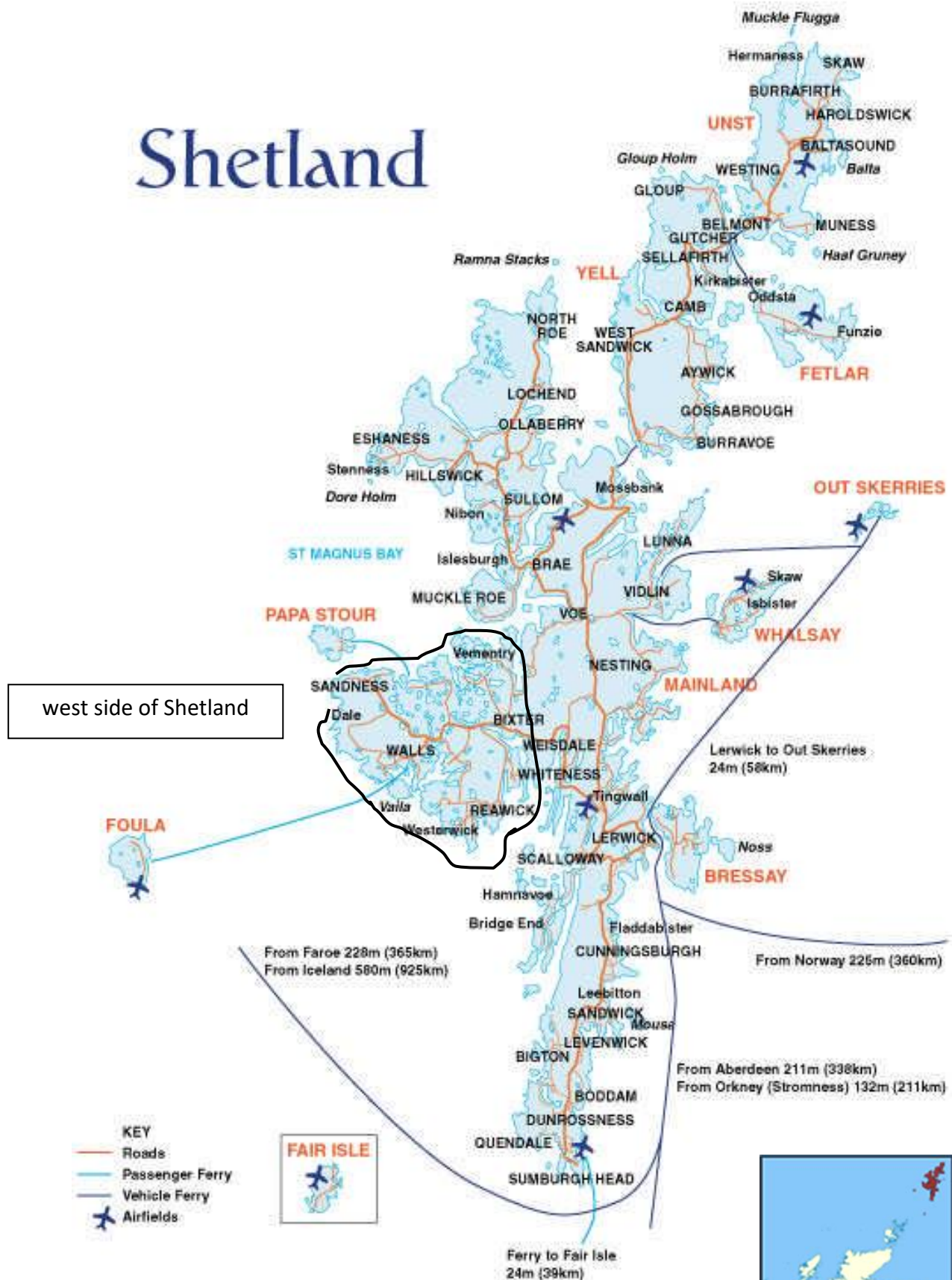
In most cases adults who had not considered climate issues to any great extent, demonstrated an initial reluctance to embrace change. However, on evaluation, participants reported a switch to more local food buying, seasonal eating, checking food miles, reducing travelling and changing heating systems. All those involved with composting were delighted with the results; learnt a lot about how much they used to send to landfill and were committed to continuing long term.

The project ran to budget throughout. Minor changes were made to budget headings, accommodating alterations in the project plan. Transition Turriefield absorbed staff travel costs, this and a small underspend allowed the purchase of training equipment to help in the delivery of courses and the inclusion of an additional event to celebrate and thank our volunteers at the end of the project.

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Shetland



Introduction

In July 2013 Transition Turrieffield was awarded £38,433.15 by the Climate Challenge Fund to develop and run the Carbon Classroom project. Based in the far west mainland of the Shetland Isles the project set out to decrease the individual and community carbon footprints by increasing the quantity of locally grown food and vegetables and reduce food waste. The project's outcomes were to:

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To do this we intended to:

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- Reduce the amount of wasted food in at least 120 households across the west side of Shetland; decreasing CO₂ emissions by at least 183 tonnes CO₂e
- Increased awareness and engagement of at least 400 members of the community in a low carbon future
- Increased use of recycled goods by at least 50 individuals

Initially aimed at the west side of Shetland the project has involved community members as volunteers, course participants and growers. We worked with individuals, community groups, schools and voluntary organisations to raise awareness of climate change, carbon emissions and food miles. The Carbon Classroom encouraged food growing, reducing food waste, composting and the use of recycled items for growing food and has ultimately inspired interest across the whole of Shetland.

The setting

The Shetland Isles is a group of over 100 islands lying approximately 160km north of the Scottish mainland. The population of around 23,000 inhabit fifteen of the larger islands which are interconnected by ferries and inter-island flights. The Isles were once a very self-sufficient community with each croft growing its own potatoes, turnips, carrots and kale. Over the last fifty years home production has declined and the availability of cheap oil has encouraged the buying in of goods from out-with the isles. Today rising fuel prices are increasing the cost of food nationwide and the impact of climate change is become more apparent. Shetland not only has additional financial food costs due to transporting goods from mainland Britain, but those goods incur additional 'food miles' to bring it to the Isles. Even more food miles are incurred by at least fifty percent of the Shetland population who live out-with the main town of Lerwick, where the two supermarkets are based. The freshness of food is also an issue; rural residents can travel up to 177km in a round trip to purchase fruit and vegetables which are at least two days older than those available in mainland Britain. For individuals and families wishing to reduce their carbon footprint or avoid agrochemicals in their diet by buying organic, the choice is yet more limited and expensive. Further difficulties arise in obtaining fresh healthy produce in winter when at times of severe gales, the regular sailing of the lifeline ferry service is disrupted, leaving supermarket shelves empty for days at a time.

The group

Transition Turriefield is based in Sandness on the far west mainland of Shetland and has been growing fruit and vegetables in since 2008. The Community Interest Company was established in January 2011 to:

‘Reduce the dependence of the local community on imported produce in the light of the uncertain future of fossil fuels, high energy costs and climate change’.

Over the last four years Transition Turriefield has worked to provide the community with fresh, seasonal, locally produced fruit, vegetables and eggs. We have also encouraged individuals and groups to grow their own produce or become involved with growing through volunteering at our growing site; developed sustainable fruit and vegetable production which reduces the reliance on fossil fuels and worked to raise individual and community awareness of environmental and health issues arising from food production and consumption. Residents from the west side of Shetland are involved with our organisation as members, Board members, volunteers and customers.

The idea for ‘the Carbon Classroom’ and a bid to the Climate Challenge Fund was born out of a desire to see positive change for Shetland. From the very beginning we had an ever growing group of people in our west side community and further afield who wanted to see a reduction in personal and community carbon footprints; effective change in Shetland’s food security and who were committed to encouraging and supporting others to make a positive changes. We heard their concerns and interests on a weekly basis as we delivered their veg boxes, worked beside them to grow the produce or spoke with them at our public and volunteer events. Taking steps to reduce carbon footprints was generally seen as a daunting prospect which required extensive, unwelcome lifestyle changes. Approaching the issue through the ‘grow your own’ route was thought to be a simple, engaging method on which to piggy back the climate change message. Success with growing would also demonstrate to participants that they could start to take small steps for positive change. We hoped too that it would lead to contemplation of the bigger issues and more lifestyle changes.

Developing and running the Carbon Classroom has enabled us to involve our community in tackling these issues and also increase the awareness raising, community growing and educational aspect of Transition Turriefield’s work.

The Carbon Classroom Project

Designed to be a source of information advice and learning, the Carbon Classroom has been used to run workshops and courses; provide information, advice and support in growing your own and encourage food waste reduction through better buying and composting. It has established a community resource providing:

- Individuals with a skills and knowledge base (a Project Development Officer and trained volunteers)
- Training materials for learning about climate change and growing your own
- An open growing site for visitors, showing what can be grown in Shetland
- Advice and support to grow your own, buy local, compost or make other positive changes to food use and reducing waste

- Demonstrations of using recycled goods in food production
- Information leaflets on the carbon footprint of food, growing your own, composting and reducing food waste

The Carbon Classroom is now:

- A place to learn about growing food
- A place to learn about low carbon lifestyles relating to food production and consumption
- The place to go for educational input to projects and school learning
- A resource used by community groups
- A viable partner for developing further food related low carbon projects across the Isles.

Grow Your Own courses have been run in local community halls across the project community area. We have worked with community groups and schools to run workshops and host visits to our site. Partnerships have been established with schools to enable extended learning about food miles, carbon emissions and reducing carbon footprints for pupils and their families. Open days have been held at the Transition Turriefield site along with Farmers' Markets to demonstrate local food options.

Initially the Carbon Classroom project was aimed at residents living in the area known as the 'west side' of Shetland, the same geographical area in which Transition Turriefield is based. A rural area of about 150 square miles (see map pg. 4), with approximately 1389 people living in small crofting communities of between 20 and 450 residents. The community, with around 499 households, was chosen as a manageable sample of the Shetland population with which to pilot our carbon reduction education work. In addition, Transition Turriefield, through the growing and veg box scheme, had more contact with residents of the west side area than the wider Shetland population. However, media publicity of the project raised awareness of our work and drew much attention from all over the Isles. To make the most of this interest the Carbon Classroom training and advice services were offered Shetland wide.

Carbon Classroom Outputs

To achieve our outcomes the project:

- Delivered 4 x 2 day 'Grow Your Own' training courses providing information on growing your own in Shetland, climate change, reducing food waste and composting. A total of 58 individuals took part
- Delivered 3 x 1 day on site workshops to compliment the training courses. Eleven of the 'Grow Your Own' course participants attended
- Ran 23 workshops for schools and groups, for a total of 47 adults and 267 young people (primary and secondary)
- Supported 12 households in the community to start growing their own
- Held 2 on-site open days, demonstrating the range of fruit and vegetables that can be grown in Shetland; the use of hand tools for large scale vegetable production and using recycled items in horticulture. A combined total of 269 visitors attended over both days and 12 volunteers were involved at each event giving guided tours, answering questions and providing advice

- Hosted 16 visits for families, groups and schools to the Transition Turriefield site, with a total of 97 adults and 174 children
- Hosted 1 Farmers Market promoting local food and raising awareness of local energy saving initiatives, 170 people attended
- Worked with the Shetland Food Producers Group to participate in the Shetland Food Fair, promoting local food. Over 4000 individuals attended the Food Fair and at our stand we spoke to more than 200, providing information, advice and the opportunity to access locally grown vegetables
- Encouraged and supported 18 households to start composting food waste and 2 communities to start composting grass cuttings from community spaces
- Put together and gave out 100 Grow Packs to novice growers to help them get started in growing their own
- Worked with a group of 10 volunteers to design, develop and distribute 4 x information leaflets on:
 - Growing in Shetland;
 - Carbon costs of food production and consumption
 - Reducing food waste
 - Composting

In addition to our intended outputs for the Carbon Classroom we have also:

- Worked in partnership with 3 schools to complement their food based projects
- Attended a local food event organised by the Plunkett Foundation, demonstrating what we grow and networking. We spoke to 16 individuals about providing local food for communities through 4 rural shops
- Gave a presentation on our work to the Shetland Horticultural Society, demonstrating the use of hand tools for commercial vegetable production and discussing the contribution of local food to reducing food miles. Twenty eight people attended the event, 8 of which requested further information, advice or involvement with our project
- Held a community event with food and entertainment which demonstrated the impact of food miles on personal carbon footprints. Thirty five of our volunteers and customers attended
- Run 2 x 'How to Put Up a Polytunnel' courses in partnership with the Scottish Crofting Federation. A total of 18 participants attended, the course covered constructing a polytunnel and its use
- Increased our growing site and food grown at the Transition Turriefield site. In 2014 with the support of the Climate Challenge funding we were able to increase our growing area by at least 1000m²; the quantity of produce grown by at least 100% and the number of households able to access locally grown food by at least 43.

For Output Grid see page 24

Achieving the Outputs

Development Officer and Volunteers

The Climate Challenge funding supported the employment of a Project Development Officer to oversee the planning and delivery of the Carbon Classroom project. The Development Officer was also responsible for the involvement of volunteers in all aspects of the project. Our team of 35 volunteers were already involved in the day to day growing operations and had the opportunity to use their knowledge, skills and experience in planning and preparing courses, designing leaflets and passing on information. Two volunteers also directly assisted with the evaluation process.



Training courses

A team of 8 volunteers met together to design the 'Grow Your Own' course and decide suitable delivery dates. They were involved in choosing course content and in trialling exercises. Courses were delivered by the Project Development Officer and the Chair of Transition Turriefield. None of the volunteers thought they had enough knowledge or skills to deliver the course at that time, however, they agreed they might consider it in the future.



The training courses were aimed at individuals who had no growing experience but were keen to grow some of their own food. Four courses ran in spring 2014 with one course each in March, April, May and June. A mix of presentations, group work and practical sessions were used to encourage participants to think through their growing needs; devise personal plans and understand what could be done to improve success in their individual growing conditions.

Information on climate change, food miles, reducing waste, using recycled items and composting was incorporated to each course. Exercises included planning a growing space, soil testing, sowing seeds, deciding what varieties to grow, understanding how plants grow and identifying pests, diseases and weeds. Each participant received a Grow Pack to help them get growing.

Workshops

The workshops made use of individual exercises designed for the Grow Your Own course, with adaptations for age and focus. Some were based on-site with practical elements, for example: using hand tools, making use of compost or manure or what produce could be grown without protection. Others took place off-site where community groups met or with pupils in schools. These workshops often looked at what could be grown and compared food miles for the equivalent produce shipped to the Isles.



We worked with 9 schools altogether, 3 of which also asked for extended project work. These schools each received an additional 2-4 inputs from us. Lunnasting Primary was awarded funding from the Scottish Government 'Food for Thought' programme and we worked with them to provide visits and workshops to consider local growing and food miles. Anderson high School Additional Support Needs department developed a growing project and the Carbon Classroom helped them to develop their own growing area. We demonstrated how to sow seeds and look after plants. Sandness primary, our local school, have now incorporated regular growing lessons into the curriculum. Over the last year we

helped them finish their growing area, plan what they were going to grow, organise rotation and harvest their crops. They learnt about plant needs, the use of hand tools, the importance of food miles and reducing food waste, how to compost and how to cook their produce.

In addition, we delivered workshops with adults who were unemployed, on low incomes or young mothers. The sessions were again focused on what they could grow and how to reduce food waste. These workshops also included the financial benefits of growing your own.

Support to grow your own

The Carbon Classroom provided information, advice and practical input on a one to one basis for households who were setting up their growing space for the first time or expanding. We had contact with the lead growers of the households between 1 and 4 times each. Information was also passed on through demonstrations, leaflets, email, telephone and Facebook postings. On two occasions we have visited individual growing sites to offer advice.



Open days

We ran two open days, the first at the end of July, on a Saturday in the school holidays and the second at the end of August, a Sunday once the schools were back. The weather was fine on both days, which encouraged attendance. A team of 12 volunteers attended both events as guides to show visitors round the site, provide information and answer questions. At each open day we ran information stalls on soil testing, sowing seeds, herb varieties, reducing waste and composting. The second open day was also combined with a Farmers Market set up in the local community hall. Refreshments were provided by the Hall committee at both open days.



Site visits

The Turrieffield growing site is open for visits all year round. Throughout the life of the Carbon Classroom project we had visitors in addition to those who came along on the open days. Schools, groups, families and individuals visited to complement their workshops and courses; to learn on site or to have a look at how we do what we do. Schools and larger groups booked guided tours and a number of couples or individuals dropped in as they were passing. Transition Turrieffield is now part of the Shetland Food Trail, organised by the Shetland Food Producers Group, linking local food producers as places for visitors to discover during their time in the Isles. Our growing site is also marketed through Promote Shetland and the Shetland Tourist Office as a learning resource for residents and tourists alike.



Local food events

Our original intention was to run two Farmers Markets, one very local to us in the west mainland of Shetland and another at a more central location. The first we combined with our second open day in August, encouraging people to visit both events. This helped with advertising and gave participants the opportunity for a full 'day out' on the west side. The initial response from stallholders for the second market we were to run in September was not as enthusiastic as we had hoped and was proving difficult to organise. In discussion with our Board and volunteers, it was thought to be more appropriate that we attend the Shetland Food Fair in November, rather than continuing to pursue a second, possibly unproductive, Farmers Market. The Shetland Food Fair attracts high numbers of visitors each year and has a Shetland-wide reach, this was appealing to us and thought to be the better option. Footfall at the Food Fair was guaranteed to be high and the event would hold less risk than the unknowns of a second Farmers Market.



Composting



Our initial idea was to supply compost caddies to our customers and regularly pick up their vegetable waste when we delivered their veg boxes. We would process it at our site and use the compost on the vegetable plots. On speaking with prospective participants it became clear that they were more interested in starting their own composting systems at home. They were keen to discover the benefits of compost for their garden and their growing. The Carbon Classroom helped participants by giving advice and information about composting and the appropriate bin to use. Each household

received a compost caddy, a log book and a set of luggage scales to help them record the quantity of waste going into the compost bin. Only two families preferred to send their compostable waste to us, dropping it off on a weekly basis. In addition, the Walls Community Development Group, on hearing of our composting scheme, approached us with the grass cuttings from their community green spaces. Grass cuttings from the housing association site in Sandness were also delivered to us throughout the summer. A surprise addition to our project the incorporation of grass cuttings has had multiple benefits by reducing the CO₂e it would produce in landfill; reducing costs to the communities for uplift and disposal and in adding to the fertility of our growing land.

Grow Packs

As part of our Carbon Classroom project we put together and distributed 100 Grow Packs containing: potting compost, seed potatoes, grow sacks, salad and herb seeds and pots. Participants also received a £5 voucher to for use at the local garden centre; guidance on how to start growing; our information leaflets and record sheets to document their results. The packs were designed to give novice growers a taste of growing their own food in a simple way. Potatoes, salad and herbs could all be grown on doorsteps or the windowsill and show that even a limited space can contribute to lowering a carbon footprint. Many of the Grow Your Own course participants took home a Grow Pack and the others were given away through our Facebook page. Originally we advertised through the local paper, the traditional way of reaching people in Shetland, but received no response. Within 2 hours after posting on Facebook all the packs



were allocated. It demonstrated the power of social media in reaching people quickly and as a modern way of getting messages across.

Leaflets

Four leaflets were designed and written by our volunteers covering: growing your own in Shetland; composting; reducing carbon footprints related to food production and consumption and reducing food waste. One of our volunteers has experience in designing publication layouts and spent many hours getting the text and photograph arrangement coordinated. The leaflets were given out to everyone who had contact with the Carbon Classroom project and used as an additional tool for passing on information. We were fortunate enough to be able to produce extra copies within budget which allows us to continue giving out information in future years.



Presentations

From time to time we are asked to talk about what we do and our motivation behind it. We use these opportunities to reinforce the message about the lower carbon footprint of local food, and in particular our commitment to growing with minimal fossil fuel use.

Polytunnel courses

During the running of the Carbon Classroom project we were approached by the Scottish Crofting Federation to deliver a course on putting up polytunnels. The tunnels used at our site are made using part recycled materials from the salmon fishing industry. Their use generates a lot of interest from local people wishing to grow under cover. The course ran at the end of May but was oversubscribed to the extent that we ran a second course at the end of June. The polytunnel courses provided an excellent additional opportunity to encourage more households to grow their own produce. At the same time the new tunnels increased our own undercover growing area by 150m². This complimented our expanding external plot and allowed us to produce more crops for the local community.



Increasing Transition Turriefield's food production

An indirect benefit of the Carbon Classroom project has been the expansion of our core work. Having a fully funded development post has allowed Transition Turriefield to continue operating; develop our



overall approach and establish ourselves as a significant organisation in Shetland. This year we have doubled our growing output and customer base. We have been able to supply local shops as well as increase our veg box scheme and allow residents living out-with the west side access to locally grown produce. This increase means we are well on the way to becoming a sustainable community project which will not only provide healthy, nutritious food with low food miles, but generate local employment and benefit the local economy. The project has also helped us move

forward with our plans to bring in horse drawn equipment to work the land, yet another step closer to maximising local food production without extra carbon emissions.

Carbon Classroom Outcomes

Our overall outcome was to:

Reduce the carbon emissions from food consumption in the west side of Shetland by at least 498 tonnes CO₂e

This is a lifetime figure based on between 2-10 years of behaviour change of those taking part in the project. In some areas our work has exceeded our targets and in others the evidence we have been able to gather has allowed us to only assess the target as partially delivered.

Our work, without a doubt, has reached many people, generating support and appreciation from individuals, families, communities, organisations, councillors and even MSPs. Throughout the last eighteen months we have worked to engage the Shetland community and change the way we think about our food. Where it comes from; the carbon costs; the need to make it more local and the huge variety of fruit and vegetables we can grow here. We have inspired and supported the community to grow more of their own; provided information and advice on growing; raised awareness of the key climate change issues and encouraged behaviour change to reduce carbon footprints. However, like most behaviour change education, the level and extent of change is disappointingly hard to evidence.

A great number of the community were eager to be involved in our courses, workshops or receive Grow Packs but have been less inclined to participate in a detailed evaluation process. In addition, it has not been possible to follow up, other than anecdotally, with a large number of individuals who had brief contact with us, for example: through a Farmers Market or only picking up information leaflets.

Our individual outcomes for the project were to:

Carbon Saving Outcomes

Increase the number of households growing their own food in the west side of Shetland by at least 60; decreasing CO₂ emissions by at least 7.13 tonnes CO₂e

This outcome was exceeded in all aspects. We engaged 111 individuals or households in growing their own produce and were able to gather data from 91 of those households. A total of 1676.12kg of produce was grown in the season April-December 2015. This figure includes 242.77kg produced from the Grow Packs given out as part of the project. Locally grown produce weighing 1676.12kg is calculated to be responsible for 0.905tonnes CO₂e (1676.12 x 0.54), a similar weight of supermarket produce is calculated as being responsible for 3.503tonnes CO₂e (1676.12 x 2.09), giving a saving of 2.598tonnes CO₂e (3.503tonnes – 0.905tonnes CO₂e) for the project. All but two of those participating spoke of their intention to continue growing in the future, with most planning to increase the area of their plots and varieties grown:

“This has been a great experience and proved that it is possible to grow our own & reduce food miles etc. even in a fairly limited space, on Shetland! It has also saved us loads of money on potatoes, so all in all a very good thing. We have managed to double our growing space for next year and are still trying to work out whether we can squeeze a polytunnel in anywhere!”

(Family new to growing)

If the project figure is extrapolated over the next 10 years, we can assume a lifetime saving of 25.91tonnes CO₂e.

Calculations are based on figures given in the 'A Low Carbon Route map' *Planning and measuring emission savings for climate challenge fund projects 2011* document and are consistent with those used in our grant application.

In addition, the support of the Climate Challenge funding allowed Transition Turrieffield to continue running and expand our work; double our growing land, vegetables and fruit in the 2014-2015 season. Overall we grew and sold produce amounting to 6154.45kg. Figures for this carbon saving are included in the outcome below.

Reduce reliance on fresh produce imported to Shetland in at least 100 households by at least 10%; decreasing CO₂ emissions by at least 308 tonnes CO₂e

This outcome has been partially delivered. Fifty seven of the participating households indicated they had started buying or increased quantities of local produce (fruit vegetables, eggs, meat and dairy); now checked the origin of their purchases and chose to buy in season. Identifying realistic quantities as a percentage of household food purchases proved difficult; however, we were able to assess a switch to buying local produce through the increase in our own production and sales. This year we increased our customer base by eleven, to a total of 29 regular boxes per week and the produce sold through our farm gate box has doubled. We have increased the quantity of produce sold to the local wholefood shop (Scoop) tenfold. Our customers have indicated their veg boxes provide their households with, on average, 35% of their weekly shop. Scoop recorded 20 customers regularly buying the equivalent of a full weekly shop of our produce and a further 25 buying 1-3 items each week. Calculations based on our production and sales of 6154.45kg indicate that our local production is responsible for 3.323tonnes CO₂e (6154.45kg x 0.54CO₂e), a similar imported quantity of produce would be responsible for 12.89 tonnes CO₂e (6154.45kg x 2.09CO₂e) + (6154.45kg x 220km x 0.0001892CO₂e additional transport to Shetland) giving a project saving of 9.56tonnes CO₂e (12.89tonnes – 3.323tonnes CO₂e). A lifetime saving of 95.6tonnes CO₂e over ten years can be estimated from these figures.

Again calculations are based on figures given in the 'A Low Carbon Route map' *planning and measuring emission savings for climate challenge fund projects 2011* document. additional transportation CO₂ emissions to Shetland have been taken as food consumed x km travelled x grand total conversion factor 0.01892 given for transporting general cargo in a vessel 5000-9999DWT in the DEFRA 'Conversion Factors for Company Reporting' excel spreadsheet (annex 7)
<http://www.defra.gov.uk/publications/files/pb13773-ghg-conversionfactors2012.xls>

We have considered only the quantity of produce for which we have been able to gather evidence. Quantities do not take into account other local fruit, vegetables and eggs consumed but not produced by us, or local meat and dairy, which we understand to be significant:

"Getting our veg from you, that's changed this year, we also get very local meat and use the Shetland dairy and bakers, so all our food has become very local"

(New customer and Grow Pack recipient)

We have we been unable to quantify with any certainty, the difference made by participants reducing the amount of out of season or high air mile fruit and vegetables they buy and have therefore not included it in our CO2e saving calculations.

Reduce the amount of wasted food in at least 120 households across the west side of Shetland; decreasing CO2 emissions by at least 183 tonnes CO2e

This outcome has been partially delivered. From our baseline questionnaire we were able to ascertain that food waste; bought but uneaten, leftovers or left on plates, was not common in the households we were working with. Our project application had assumed a larger quantity of food wasted by our community. Participants did acknowledge there was 'some' or 'a little' food waste in their homes but were confident that hardly anything was sent to landfill. As quantities were self-reported it is not clear whether households are unwilling to admit food wastage or if there is genuinely little waste going to landfill. However, from the evaluation we are aware that information on reducing food waste has made a difference when course participants described changes they had made:

"Plan shopping, making list before buying. Food wastage has gone down because of the better planning"

(Voe 'Grow Your Own' course participant)

Composting was identified as a mystery activity for a majority and, for those that had tried it, often difficult and frustrating. We were able to help 18 households and two communities to begin composting from scratch and a further 25 households improve their composting techniques. We were able to gather information on the quantity of composted waste from April 2014 to the end of the calendar year. Gathering weekly quantities allowed us to estimate a full yearly total for the weight of food waste diverted from landfill to compost bins or, in some instances, for animal feed.

"I was stunned at how much food waste I produce; at least it's all being put to good use now"

(Walls 'Grow Your Own' course participant)

The amount of food composted and fed to animals recorded by our participants was 5086.66kg and calculated to increase to 7636.08kg for the whole year period. By being composted the food waste is responsible for 28177.13kg CO2e, (7636.08 kg x 3.59 embodied emissions + 0.1 emissions from composting); had it been sent to landfill, the same quantity of food waste would have produced 30849.76kg CO2e, (7636.08kg x 3.59 embodied emissions + 0.45 emissions from landfill) giving a project saving of 2.672tonnes CO2e. The figure may be extrapolated over a 10 period giving a lifetime saving of 26.72tonnes CO2e. Conversion factors taken from 'CCF CO2e recommended conversion factors Jan2014' document available on the CCF website.

Community Outcomes

Increased awareness and engagement of at least 400 members of the community in a low carbon future

This outcome has been exceeded. Throughout the life of the project we have had extended contact with at least 901 individuals working with them through workshops, training courses and advice and information sessions. In addition, at least 35 volunteers have been involved with our work and more than 370 individuals have visited our local food promotion markets or attended a presentation given by us. Media coverage of our work has increased interest in our community food growing project and our

carbon reduction approach. Throughout the 18 months of the project we have seen our volunteer team expand by 10; our customer base increase by more than 40 and the Facebook page we started to promote the group grow to 421 followers.

"I love it I really do [the carbon saving experience], really enjoyed the course, being there with like-minded people, learnt so much. The climate change stuff was good though because it does make you more aware"

(Voe grow Your Own course participant)

We have given out at least 500 of each of our 4 leaflets. Some of which went to the pupils and parents of local schools. In some cases this initial contact lead to extended involvement with schools:

"it is extremely beneficial for the pupils to meet new people and learn key life skills which they can put into practice back in the classroom and at home. I did not expect that an email enquiring about Grow Packs would lead to this opportunity for my pupils"

(Teacher Anderson High School)

The community will continue to benefit from the legacy of the Climate Challenge funding through the continued work of the Carbon Classroom as a learning resource.

Increased use of recycled goods by at least 50 individuals

This outcome has been partially delivered. The baseline, pre-intervention questionnaire indicated the use of recycled materials was limited to small everyday items such as plastic bags, jars and plastic tubs. From the 88 post-intervention evaluation responses, 33 participants recorded using more substantial recycled items in their growing after they had been involved with our project. A wide range of items were being used such as: tyres, mussel floats, plastic barrels, salmon farm feed pipe, reclaimed wood, polystyrene boxes and pallets. The items had many different roles including: planters, compost bins, wind break, seed trays, polytunnel frames, water butts and fence posts. Participants suggested they were beginning to think more widely about what could be saved and used instead of going to landfill.

"We think more carefully about what we can do with things before we throw them out—they might be useful in the garden!!"

(Walls Grow Your Own course participant & veg box customer)

"I'm gathering recycled containers for growing in next year"

(Grow Pack recipient)

In Conclusion

It has not been possible to gather enough evidence to give a complete picture of the outcomes based on behaviour change. The rural and dispersed nature of our target group proved difficult to pin down for both the baseline and follow up information. The community were eager to participate in the learning and growing but much less so in the evidencing of the changes they had made. Rather than guess, we have only used demonstrable evidence to calculate CO₂e savings. Anecdotal evidence suggests that a high number of residents are buying more Shetland produce, choosing British over imported goods and thinking more carefully about out of season produce. Where we have been able to gather information it indicates a high level of participation, enjoyment and learning. We believe that if

only half the people we have had contact with have begun to take steps to reduce their carbon footprint, as demonstrated by those we have been able to gather information from, our project has made a significant impact in our community; that the work will continue to grow in the future and provide a sustained reduction in carbon emissions for Shetland.

"This was a very special thing to do with my son - it provided an opportunity for discussion and time together, discussion of what we were growing, best positioning and care, etc., but also as a means of being together and creating the space to talk and share on wider issues."

(Grow pack recipient)

Learning and Reflection

Generally people are reluctant to engage with Climate Change issues

We were surprised at the reluctance of individuals to engage with climate change issues. At Turrieffield we have been working to reduce our carbon footprint for many years and being so immersed in it, we had underestimated the general population's lack of knowledge and interest in the subject. At our courses we sensed a lack of enthusiasm which we suspected arose from a sense of guilt and the knowledge lifestyles would have to change to make a real difference.

Growing your own is an excellent, non-intrusive way of raising the climate change subject

It also provides a marvellous chance to demonstrate growers' carbon cutting successes, achieved with less effort than participants were expecting. It has been an all-round positive experience, giving a great 'feel good factor'. Individuals who have been involved with us have also gained a sense of being part of something bigger and they feel they have made a difference. At the moment they might be only lightly engaged with climate change and we might lose some on the way; however, there are unquestionably more individuals who are aware of climate issues and are contemplating change.

Evidencing change is difficult

Busy lives, too many questions; like the climate change issue providing detailed evaluation information proved too demanding for many of the households involved with us. In the end we made the decision to choose engagement over detailed evidence. This has perhaps given us less demonstrable CO₂e reduction but we believe has been less alienating for households and allows us to continue gently drawing attention to climate change; engaging individuals and supporting their positive lifestyle changes.

There are individuals and groups who would benefit from more targeted work.

The Carbon Classroom has brought us into contact with individuals and groups with higher needs, on low incomes or who are harder to reach. Whilst we were able to deliver an initial input, it was clear that extended targeted work could benefit individuals in multiple ways. Baseline information from these groups indicated much less engagement in activities which contribute to CO₂e reduction. Encouragement and support to grow their own could provide low cost food with a higher nutritious value, as well as reducing carbon footprints. It could perhaps also offer therapeutic opportunities working outside in a natural setting and generally contribute to more positive lifestyle choices. The focus of our project did not allow the higher level of input required for the successful engagement of these individuals and we were unable to work with them in any significant way. However, this work could be a focus for a project in the future.

Running a project this size creates huge demands on our responsible people

The Carbon Classroom project brought with it funding that was essential to keep our community growing initiative going. It has allowed growth and built long lasting relationships with customers, voluntary and statutory organisations, councillors and MSPs. The Carbon Classroom has caused significant changes to our strategy and operations, all for the better and establishing us as a key resource in the community. However, it has not been without negative consequences; pressure on staff and volunteers and problems with achieving the main aim of growing our vegetables. We acknowledge that neither aspect could have been achieved without the other. The Carbon Classroom project perhaps came too early in the life of our organisation but, with the help and support of our followers we are now in a much stronger position for both our future food production and promoting carbon reduction.

Social media is essential to reach more people

We embraced Facebook reluctantly; however it has consistently rewarded us with far bigger returns than the more traditional newspaper, or poster approach, when engaging with the community.

For further individual learning and reflection see staff, volunteer and participant contributions page 27.

Finance and Administration

Our total funding award was £38,433.15. The 18 month project concluded with a small underspend; actual expenditure is broken down as follows:

	£
Staff salary	28,461.42
Employers NI	2,210.06
Recruitment	80.08
Training materials	284.05
Training equipment	994.15
Leaflet production	626.93
Grow Packs	1,736.15
Compost caddies	565.90
Information resources	414.50
Evaluation equipment	340.55
Advertising and promotion	1,327.68
Venue hire	433.14
Volunteer expenses	491.55
Volunteer event	394.48
Total	38,360.64

With careful monitoring the budget ran to target throughout the project. Transition Turrieffield absorbed all staff travel costs which, combined with an underspend on the leaflet production budget, allowed us to purchase training equipment to improve our delivery of the Grow Your Own courses in rural halls. It saved many hours, miles and CO2 emissions through not having to travel to borrow the equipment. Information resources were also additions arising from our year one underspend and were used to further supplement Grow Your Own and carbon reduction information in our Grow Packs. A small underspend in year two allowed us to host an end of project event to celebrate our volunteers' hard work throughout the initiative.

At the beginning of the project we were required to register as an employer with HMRC; establish Real Time Information and get to grips with Basic PAYE payroll software. A steep learning curve that brought occasional panic, particularly around 'end of financial year reporting'. As a result of complications with tax codes the software calculated over payments to HMRC which were difficult to believe. However, after convoluted phone enquiries, the calculations were shown to be correct and we could understand how the figures had been worked out. Becoming an employer and working through the minefield has been extremely beneficial to our group. We are now already set up to take on more employees, graduate placements or apprentices as the opportunity arises.

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Supporting information



Evidencing the change

To understand the impact of our project and the extent to which we had met our outcome targets we collected both quantitative and qualitative data throughout the life of the Carbon Classroom. The evaluation was carried out internally by the Development Officer with assistance from two volunteers.

At the start of our project all individuals who had extended contact with the Carbon Classroom were asked to complete a lifestyle questionnaire. A paper form was chosen for use as the most practical and available method of collecting data from participants in widespread rural areas. It was not possible to use online methods for carbon footprint calculations; the community halls where our courses were run do not have internet access. Information gathered included buying habits; frequency and type of travel; regular food use and waste, composting, recycling, energy use and energy saving measures. The form and questions were based on online CO₂e assessment tools and were used to give us a pre-intervention baseline, or starting point.

Our intention had been to ask participants to complete a similar form post-intervention, to allow us to compare answers and extract changes made. Ultimately this was a too complex an approach which presented difficulties at the final evaluation stage of the project, both in getting the form to the participants and retrieving information. We found people were far more receptive to the evaluation when telling us what they had grown and the changes they had made with brief, easy to access methods. Conversely, in this instance, online methods accessed from participants own homes proved an ideal solution. Regrettably, not reusing the lifestyle questionnaire reduced the evidence for behavioural change. Participants tended to focus on their practical achievements and were less likely to self-report change in their approach to shopping or the origins of food bought.

Post intervention quantitative and qualitative data was gathered using 12 questions either through online questionnaires, email or via a telephone interview. Information was collected on the three different aspects of our intervention: growing your own, better buying and waste reduction. Questions covered the weight of produce grown, size of cropping area, weight of compost/other food waste, lifestyle changes and their comments on the change in their carbon reduction habits.

Further quantitative data, relating to the weight of grown produce, was gathered from our sales records including: daily sales records for the farm gate produce; diary records for Farmers Market and food fair sales; weekly veg box customer sheets and invoices for local shop sales recorded on our accounts package. We have also used information from our monthly CCF progress report forms, minutes and records of meetings and planning records to inform our final report.

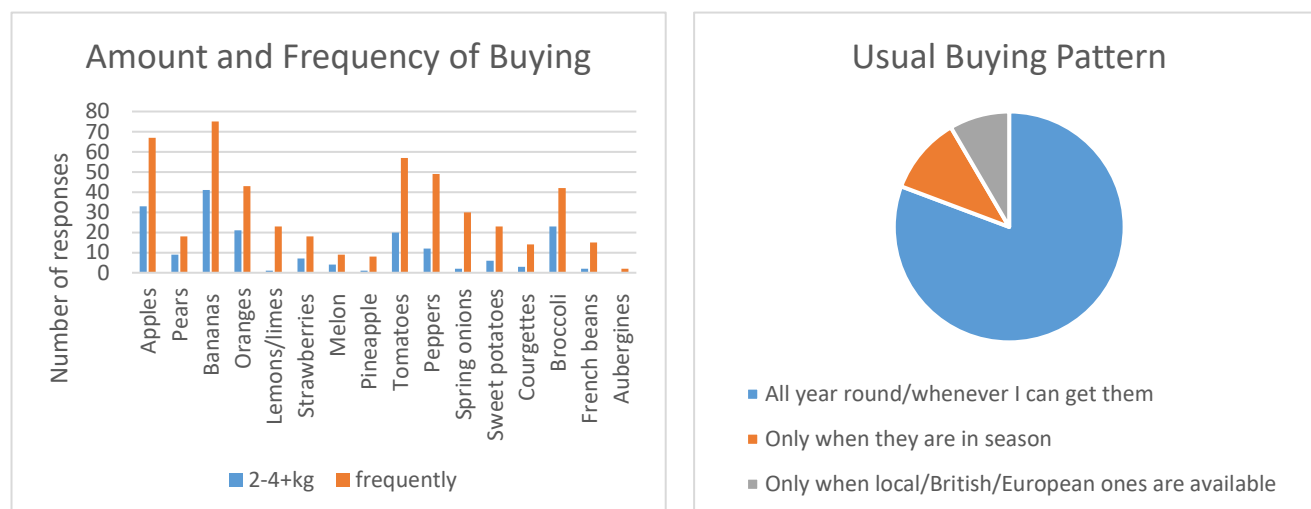
For individual involvement we kept records of volunteer activities; attendance at courses, workshops open days and Farmers Markets. The Shetland Food Fair holds its own official count of overall footfall and we recorded number of sales and people spoken to at our stand.

Setting the Baseline

Seventy nine participants returned baseline questionnaires and the data was compiled to give a broad overview of the community approach towards carbon emissions.

Responses demonstrated that in general households were not considering the origin of their shopping items and they were purchasing foods with excessive air miles regularly. Bananas, fruits with significant

air miles, were most popular with 32% of households buying 3-4+kg every time they went shopping. Tomatoes were an item bought frequently too and a popular out of season choice.



Whilst around half of the households had tried growing their own, for the most part it had been limited to salad and herbs which contributed to ‘some meals throughout the year’. Food waste was not particularly seen as an issue; however, at least half of those taking part stated they regularly threw food into the bin. More than 50% of our participants did not compost but acknowledged its benefits to compliment growing. Composting lessons were identified as a need within the community.

Most people recycled glass, less frequently metal and least of all paper and plastic. For the most part using recycled items for other purposes was limited to small items such as plastic bags, takeaway containers and plastic tubs.

The majority of households owned 1-2 cars with engine sizes 1.4litres and above. There were a significant number of households using vehicles with larger engine sizes of 2litres and above demonstrating the significant use of vans, trucks and land rovers found in rural areas. One third of households estimated they travelled approximately 8,000 miles per year; another third up to 10,000 miles per year with the final third travelling up to 28,000 miles per year. Public transport was the main travel choice for less than eight percent of households; however, more than two thirds chose walking or cycling when travelling for distances less than two miles.

Oil and electricity are the main sources of heating homes in the Isles, with less than 8 percent of homes using alternative renewable energies. Three quarters of households have insulation in the roof or double glazed windows and use low energy light bulbs. Less than half have extra insulation in walls or floors. Fridges, freezers, televisions and mobile phones are the most frequently owned appliances, with all households having at least one of each and two thirds of households leaving their equipment on standby.

Climate Challenge Output Grid

How many training sessions where skills and/or information were passed on – e.g. composting training, cooking workshops, etc. – has your project has held.	34
How many events did your project hold, e.g. information fairs, open days, etc.? Do not include events held by other organisations which you have attended.	3
How many people were directly employed by your project? Tell us the full-time equivalent (FTE) number of employees (e.g. 3 days per week = 0.6 FTE).	1
Is the project is supporting the development of any long-term jobs which are not dependent of CCF Funding? How many?	2
How many people are actively involved in your project – attending groups & workshops, using the project facilities etc.?	901
How many people volunteer their time and energy to keeping the project going – don't forget the members of your management committee or board.	35
How many schools are involved in your project?	9
How many square metres (m²) of community growing space (allotments, poly-tunnels, raised beds, community gardens) has your project brought into use?	3755m ²
How many tonnes of waste have been diverted from landfill because of the activities of your project?	7.636t

Additional findings from the end of project evaluation

Growing Your Own

Most people attempted to grow more vegetables, salad or fruit than the simple Grow Packs they received. Grow Your Own course participants particularly, were inspired and encouraged to be productive at home:

“Very good experience and it has encouraged me to grow more produce”
(Course participant)

The Grow Packs also helped people get started:

“It's really made me think and it makes me feel happy and proud that I can do this growing stuff. I never would have believed it if I hadn't tasted the difference. It was great not having to drive to get some salad to go with my meals”
(Course participant)

Potatoes, carrots, beetroot, salad and herbs were the most popular additional growing choices, with some people also trying more unusual crops such as sweetcorn and pumpkins

"There there's such a variety of stuff to be grown--when we were bairns it was just neeps and tatties and kale but nowadays there's so much more"

(Course participant)

Individual plots came in a range of sizes from windowsills to 'a field'. Productivity of growing areas were equally varied, as was the success rate. However, most people's growing was productive enough to provide items for meals throughout the season.

"I love being able to reach for my own tatties and herbs. Over the next few years I hope to increase this! I love the taste of freshly grown food in comparison to shop bought."

(First time grower & Grow Pack recipient)

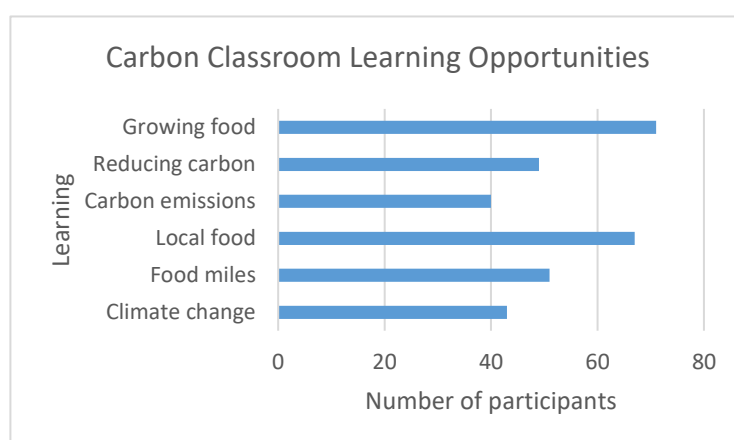
To add value to the Grow Packs we negotiated with the local garden centre to provide additional £5 vouchers to be spent on gardening items. At the end of the project the garden centre reported a 20% uptake. Twenty out of the 100 vouchers given away had been used compared to the expected average up take of 5% of previous initiatives. This could perhaps be seen as further evidence of the extended contact and support given by the Carbon Classroom in encouraging participants to have a go at growing their own.

Reducing carbon footprints

Customers and volunteers of Transition Turrieffield who received information about cutting their CO2 emissions reported reducing travel, changing their heating methods and installing renewable energy sources. This perhaps indicates they are further along on their journey in reducing their carbon footprints than those whose first contact with us has been through the Grow Your Own courses, open days or local food events. Our customers and volunteers might be involved with us because they are already seeking carbon cutting solutions or, could be carbon cutting as a result of their involvement. In all likelihood, there is an element of both, but it suggests extended exposure to the issue of climate change contributes to positive change.

Focus of the project

The Carbon Classroom provided participants with opportunities to learn about a variety of topics related to climate change and food growing. When asked what they had learnt, at least half thought they had more knowledge of all the topics. Everyone who had responded to the question indicated they knew more about growing food and a majority stated they now knew more about local food.



"I think volunteering at Turrieffield and attending the 'growing workshop, certainly raised my awareness of food miles, and food wastage"

(Course participant & volunteer)

Less time was spent on the harder hitting topics of Climate change, food miles, carbon emissions, and reducing carbon; however, these are also the topics which participants found less interesting (see Grow Your Own course evaluations, appendix ii, page 36). Throughout the project we found there to be a difficult balance between engaging and continuing to retain participants in the project and the need to pursue the climate change agenda. Overall we think a good balance was achieved, which maintained involvement in the growing and built a sense of community camaraderie:

“Great local connections and generous friendship as part of the group”
(Course participant & volunteer)

Composting

All households new to composting appeared to be happy with their results and planned to use the yield in their future growing:

“All good. The destination for the compost will be the veggie beds & polycrub”
(Composter)

There was very little food waste identified as going to landfill following the composting project. A significant number of households fed animals and birds with meal leftovers. This possibly reflects the rural nature of the project area and the number of participants with crofting connections. Traditionally no food is wasted and scraps are regularly fed to animals. There is no indication that this practice changed as a result of the Carbon Classroom project.

Future Developments

The Carbon Classroom has covered a lot of ground in the last 18 months. It has inspired and initiated a lasting legacy in our community and we plan to continue development beyond the end of the Climate Challenge funding.

At the time of writing we:

- Have set dates with three schools for return visits with new class groups and one for a visit for a new community group
- Have organised two Grow Your Own training courses to be run on behalf of the Scottish Crofting Federation (SCF)
- Have outlined a third course on composting to be run on behalf of the SCF
- Are planning another open day and Farmers Market in our local community
- Are working with the Shetland Food Producers Group to develop and promote local food products and outlets
- Are offering ongoing support and advice to local people in growing, plot planning and polytunnels
- Are increasing our own growing space and improving productivity
- Are developing low carbon solutions to growing in Shetland on a commercial scale

We are currently working to create undercover space where training can be held onsite and we can develop a physical Carbon Classroom for community use.

Thoughts from Project Participants

A selection of people with experience as Board members, volunteers, course participants, composters and Transition Turriefield customers gave their thoughts, in some cases very candidly, on their involvement, the project, climate change and the difficulties of changing behaviours.

Cushla Bretton course participant and veg box customer

Where I work at the Shetland Museum we have an exhibition of a famous war photographer who was at every conflict during the second half of the 20th century. The images are powerful, violent, cruel and disturbing. All visitors are moved, sometimes to tears, but the main reaction from everyone is, what can we do? How can ordinary people stop this? Why does this go on? Is war and cruelty inevitable? Staff and visitors feel powerless in the face of the cruelty and tragedies they see in the photographs. They just know it is wrong and they want it to stop.

I feel a bit the same about climate change as well. Since being in touch with the folk from Turriefield, we have become much more aware, and have tried to follow some rules and prescriptions. But when I read that we are 3 minutes to midnight in the world's life, I have to ask what is the most effective solution?

As to renewables, the wind farm question here is fraught with some basic ironies as to the amount of damage the huge turbines will create. I remember being very surprised many years ago that David Bellamy was so opposed to wind farms, but now I understand his reasoning.

A person on a lower income could not afford a small wind turbine for their home...nor could they afford solar panels. However we spent a huge amount on insulation when we renovated this house....(we have never had a heater on upstairs).but it still rankles with me that people received grants for similar work, but as we had not lived in the house we had no figures to show what our electricity use was, so could get no discount. Only the two most well off people we know have solar panels and wind turbines. Ironically, they also pay low road tax as they have splendid new low energy use cars.

Penny put out a great challenge at one of the courses I attended. What in your life or home is not based on oil? Well! Everything is....except maybe simple pleasures like walking (hmmm, what about shoes and roads?)

Our household looks much more carefully at the food miles now. We are buying more local food, we are lucky to have a great source of varied vegetables nearby. Lamb with only 2 food miles! (Plus to and from the abattoir). We are burning peat. (But what about the CO₂ released?) We wear natural wool thermal clothing. We try and ask if we really need what we are going to buy. We use public transport, buses and trains when on holiday. But we fly to see our family in New Zealand.....

What about the drop in oil prices? I believe this shows that there are questionable politics behind the cost and supply of fuel. I will be asking the candidates in the upcoming election season what their party's plans are to deal with climate change.

The only big success I can report is the Scottish plastic bag campaign....that feels as though a step forward has been taken. To get it into law is just fantastic. For the environmental groups to get the message across is marvellous. And people totally support it.

We now read and comment and discuss any news article we see about climate change. We compost organic waste. We despair at packaging. Cultural taste means we want passion fruit from the Southern hemisphere occasionally. Oh dear, they were from Colombia and we ate 6...

We have decided to live with one car. This will happen soon and will mean a lot of organising and extra time spent waiting for buses. I am not quite sure about how to get from Walls to our house. I hope this decision does not cause too much stress.

I wish it was not such a choice...I love flowers in the house. They do provide employment, but my pleasure and some other people's work and income is using scarce energy resources.

I know these comments are not a positive list, but it is from the heart!

Esther Renwick Grow Pack recipient and open day visitor

Esther knew about Transition Turriefield but heard about the Carbon Classroom project and the Grow Pack offer through our Facebook page. She and her husband brought their three children to visit one day when they were passing. The children asked to come back during the open day in July and returned again for the second open day in August. The turkeys and pigs were a big attraction. All three children sowed some seeds in pots and took them home to grow on the windowsill. As a family they decided to spend their £5 garden centre voucher that came with the Grow Pack on extra seed potatoes which they planted in the plot outside their house:

"We enjoyed our experience very much, we learnt that growing our own veg was not an arcane and intimidating art, it was something we could do, even on Shetland and with limited time. Besides ending up with loads of produce and the confidence and enthusiasm to grow more we were also far better armed to do something about the food miles of what we were consuming, something we had been aware of but thought we were largely stuck with living in a fairly remote location. We have also increased our recycling further and of course found a great use for all the muck our ponies produce!

Our kids (4, 6 & 9) have become heavily involved and enthusiastic, in fact our 6yr old asked for a big watering can and a set of 'proper, grown-up' gardening tools on her list for Santa (which she received, among other things, and is very proud of)! As a direct result of this experience we increased the size of our growing area last year and grew enough main crop potatoes to feed us from September to January, we have increased our growing area again for this year and are still trying to work out if we have anywhere we can put a small polytunnel or greenhouse.

The children have been excitedly tracking the progress of our growing and were disappointed when we finally had to add potatoes back on to our weekly shop instead of digging them up! They also love picking rhubarb and blackcurrants and our keenest gardener (the 6yr old) is in charge of the compost heap as well and makes sure it gets "fed" properly. It has taught them a lot about where their food comes from and our eldest now reads the labels on supermarket food and helps in choosing high welfare and low food mile options. It has been a huge inspiration to us and the children are already asking when we can start planting again this year and when the next Turriefield Open Day will be held"

Jeff Gaskell Board member Grow Pack recipient and composter

My first involvement with Transition Turriefield came in May 2009 when I was asked to provide some help on the development of the Transition Turriefield business case through my work as a Business Gateway advisor. Part of my early working life had been spent as a commercial horticulturist involved

in the setting up of commercial and not for profit crop production businesses in other parts of the UK so I had some insight about the problems and challenges that would need to be addressed.

Shetland has to be one of the most challenging places to grow commercial crops in the UK .The combination of high wind speed, low temperatures, relatively low light levels, salt laden winds from all directions, and acidic soils would be difficult enough for experienced horticulturists equipped with labour saving powered equipment to cope with. But Penny and Alan were determined to make it work and without the use any equipment powered by fossil fuels, they had a clear vision of how they wanted Transition Turrieffield to develop and the determination, enthusiasm and energy to make it work and which doesn't seem to diminish.

I was initially concerned about their limited growing experience and their commercial nous. I understood that their growing experience had been on a relatively confined space in the urban, soft south (Edinburgh). How would they transfer that experience to Turrieffield? Especially as their vision for Transition Turrieffield as a production unit and learning resource that would also offer volunteering opportunities and then paid work would all be based on their ability to grow, harvest and then distribute substantial quantities of produce.

Through a great deal of hard work, book research, field research and trial and error the holding is developing and the pace of that change is rapidly increasing. Crop yields are improving, more land is being brought into cultivation, livestock and poultry have been introduced and there is a growing community of people of all ages, both Shetland residents and others from outside the islands who freely volunteer at Transition Turrieffield. They help the Transition Turrieffield project, improving the quality of the growing areas, introduce new facilities and be involved in the day to day cultivation and harvesting of the range of field grown and protected crops. They might not know anything about horticulture or the transition movement when they first turn up but they soon learn. They benefit personally by developing new skills, being involved with growing and the cycle of events from sowing to harvest and the through the comradeship that develops by working with others. The 2014 Carbon Classroom initiative enabled Transition Turrieffield to engage with a wide range of individuals and organisations in a relatively short time frame. As a Transition Turrieffield volunteer director I was involved in devising and participating in the selection process that recruited the project officer.

From an organisational perspective the amount of interest generated by the Carbon Classroom project was surprising and included:

- Individuals with an interest in horticulture and the transition movement ,
- Schools groups from all parts of Shetland ,
- local authority officers,
- Highlands and Islands Enterprise HIE,
- Voluntary sector organisations
- Other statutory organisations including those working within the Scottish judicial system.
- Other Shetland based businesses including selected food and drink producers who did good business during the two open days.

The benefits from the Carbon Classroom initiative for Transition Turrieffield included:

- Experience in recruiting, inducting and managing staff and volunteers
- Experience of developing and presenting courses and learning material
- Experience of organising events
- Hard won experience in managing the marketing and the PR process

- An opportunity for significant enhancement in the value of the Transition Turriefield brand
- A great deal of potential for expanding the customer base

The number of visitors at the two open days that were held during last summer exceeded all expectation and interest continues to grow not just from here in Shetland but from overseas as well. From other communities who see the benefit of growing produce locally and who want to utilise the experience and knowledge that has been accumulated at Transition Turriefield over the past 6 years.

As a Carbon Classroom participant I recorded the amount of compostable and non-compostable waste produced by my household during the season and also the amount of produce harvested from a very limited growing space. The things I learned included, that...

- My household produces much less non compostable waste than I imagined.
- My household produces more compostable waste than I imagined
- My composter isn't very efficient and I need to develop my skills.
- High value veg and salad crops can be produced in significant quantities for a much longer season than I imagined.
- Potatoes are not worth the effort

There has been a great deal of learning on the commercial side too.....

- Getting the pricing right,
- Dealing with the practicalities of regular deliveries to customers who may be some distance from Sandness
- Getting to grips with full cost accounting
- Raising awareness about Transition Turriefield and the Transition movement by using the most apt marketing methods

There may have been some minor diversions along the way but I believe that the progression of Transition Turriefield is still on track and Alan and Penny's original vision for the place remains as fixed as it was a decade ago.

Luke Bullough course participant

I was aware of some of the issues around climate change but the Carbon Classroom course was a very good reminder of what is happening and the issues we simply can't afford to neglect. More importantly it educated me that we could reduce our own carbon footprint (recycling/composting/growing) quite simply.

I enjoy trying to propagate and grow trees in our Shetland garden but I'd never attempted to grow our own food. The course made me realise it is something I could do and provided me with the basic knowledge and confidence to give it a go. I have been amazed at what we have been able to grow this year (and how good it tastes). Most days since the course something we'll eat has come from the garden.

Our children are enjoying it all too and as a spin-off learning things that I hope will stand them in good stead in the future too.

I would commend this course, its contents and its objectives and would hope that many more people are able to benefit from attending it in the future'.

Leigh Evans Board member

I was involved, as a board member, in the early stages of the CCF project and in the recruitment of the Development Officer. A long illness then prevented me from being involved as the project developed.

I wasn't able to be present at the initial Board meeting to discuss selection criteria and advertising the post in the local newspaper; however, I did participate in the later stages and was involved in agreeing and formulating questions for the interview and interviewing. We related the questions to the selection criteria and did some research on the best way to style the questions. We didn't want the questions to be intimidating and we found several helpful websites that gave us examples and ideas for us to work from. The questions were specific but phrased in a way to encourage the candidates to discuss and develop their thoughts and ideas.

We also had to decide how to 'score' responses so that we could be sure that we were as unbiased and impartial as possible. It would also enable us to give detailed and specific feedback to candidates after the interview. It was a simple score method that we recorded discreetly, with comments, on identical sheets as the interviews were in progress. We were then able to compare notes and scores effectively and found that the board members agreed closely on the outcomes of the interviews. Penny was an outstanding candidate and clearly merited her appointment to the post.

Overall, I think this process was fair and successful, although it did raise some discussion and minor differences of opinion within the board. For example, board members decided, on reflection, that the selection criteria was perhaps too long and specific. This may account for the low number of applicants. Several people expressed an interest but only two candidates made a formal application. It was suggested that broader criteria could have drawn other candidates with relevant, useful experience from a wider sector of Shetland society. On the other hand, Shetland is a remote island with a small population and it can be difficult to recruit people with necessary, specific skills.

Lastly, I wasn't sure if it was ethically 'correct' to include the second candidate for interview. His written application clearly showed gaps in essential criteria, so I didn't think it would be possible to appoint him, even if he did a very good interview. I was concerned that he would invest a lot of time and emotional energy into the process with little hope of success. However, the other board members felt it was important to 'give him this chance' and to ensure that we had a truly fair recruitment process.

Overall, being involved in the CCF has been an interesting experience. Working with people with high aspirations and ethical standards is very motivating. However, I had grave concerns about the effect this project would have on Penny, her family and Turriefield croft. Penny seems to have achieved everything she set out to but I wonder if the personal cost was worth it; Penny seemed tired and stressed at times which was very understandable.

And I wonder about the long-term impact of the courses. The demographic appeal was, I think, limited; were Penny and Alan preaching to the converted? People who attended the courses responded enthusiastically, and seemed to enjoy, in particular, the sense of community - of being part of a group of people attempting to grow vegetables, to varying degrees of scale, in Shetland. Whilst I think I agree that small changes to our consumer lifestyles are 'good' I wonder if it's 'good enough'. Perhaps it makes us feel too 'cosy', that we're 'doing our bit'. I am reading various writers' contributions to the climate change debate (for example, Naomi Klein) and think that people need to make radical changes to make meaningful change. Yet, I witness two very good people doing just that and it seems so hard, too hard.

And now I must confess that I have given up my two small raised beds (for vegetable growing) to create a pond and wild area for insects, birds and other wildlife. It just felt tokenistic and didn't make much impact on our grocery shopping: the area and yields were too small for the effort. Yet, I am not entirely lost to the cause of grow-your-own as I have spoken with two friends about shared growing. Perhaps this is the way forward, community-shared agriculture. Let's not be glib though. I have tried a community growing project before and know that finding committed participants is the hardest thing to do.

Janet Wilkes, customer, volunteer, course participant, Board member

Following contact with Transition Turrieffield and the Carbon Classroom project, I decided I would like to expand my growing. I approached my neighbour, and was able to have the use of an old kale yard which had lain unused for 20/25 years, situated in a fairly sheltered area at the back of a row of derelict cottages. The soil proved to be a dark rich crumbly loam, the result of many generations of being worked with the incorporation of seaweed. The area was fenced and rabbit netted, the growing area measured 15.6 m x 10m. I grew 5 rows of potatoes, a row of swedes, carrots, and onions and experimented with peas and broad beans. About one third of the plot was used for the propagation of trees from cuttings, assorted willows and poplars. Overall both the trees and the vegetables have been successful, the only problems being with the swedes which were quite badly affected by worm. This year I plan to use a different variety called 'Gowrie' which has a good local reputation. The potatoes were good at the point of lifting but some have deteriorated during storage, becoming dry and shrivelled on the outside, and rotten on the inside, perhaps dry rot. This year I plan to give them a longer drying off period after lifting.

However, overall much good produce has been grown, and this has led to sharing out between friends and neighbours and to 'swaps' (It was very satisfying to hear that the bill for replacing a bearing on my car was less "on account of, all that veg we got fae you!"). The growing this year has given pleasure to myself and my neighbours, some have been drawn in by my asking for advice and reassurance, about spacing and timings. So that I was able to benefit from their great experience and knowledge of crofting, others were drawn in, just by seeing things growing, and receiving a share of the produce. I feel that the growing this year has had many benefits beyond the obvious ones of excellent fresh vegetables, zero food miles, and a lower carbon footprint, and for me this has been the social interactions and contacts with others, who are also beginning to grow or who are interested to see how it's done, or to sample what's grown.

This for me has been the essence of Transition Turrieffield's Carbon Classroom project....to promote the flowing/ transference of growing knowledge and to ignite the flame of enthusiasm for growing.

Alan Robertson Transition Turrieffield Chairman and Operations Manager

The Climate Challenge funded Carbon Classroom project represented a turning point for Transition Turrieffield. It enabled us to tackle our educational objectives whilst helping support our primary aim of providing local food for the community.

Underpinning our work is our belief in reducing fossil fuel use to cut carbon emissions from food production. We have worked for many years to minimise our own personal carbon footprints and we knew of others who wanted to understand the climate change issue better and were asking for help to make practical changes. I believe that subconsciously we hoped there would be others amongst the wider community who would be willing to grasp the thorny subject with understanding and enthusiasm and that we could look to realistically furthering the Transition movement in Shetland. However, the majority of individuals, household and groups we had contact with throughout the project shied away

from openly embracing climate change issues. We felt the reluctance to change behaviour and a resistance to discuss the issue. Talking about growing food is good, being part of a community that is changing the way Shetland thinks about food is good, excellent in fact, but just don't mention climate change. It will spoil the mood, put people on edge; take away the fun and camaraderie.

At the end of the project this mind set is disappointing to us, but we acknowledge and appreciate the impact the Carbon Classroom has had in the community and not just on the west side, but across the whole of Shetland. We know these things take time and it is a slow process. We have far more people engaged than ever before. Hundreds more are excited by local food and are hearing about how it gives Shetland more food security and reduces our carbon footprint. Hundreds more are amazed and inspired by what can be grown so far north; how much they can do themselves and how much better it all tastes.

Transition Turriefield will continue to demonstrate commercial horticulture and agriculture which uses minimal fossil fuel use and explain the CO₂e reasoning behind it. We will continue to grow more food for the local community and we will continue to run the Carbon Classroom providing visitors, schools and young people with a resource for learning about food growing and climate change; support to grow their own or how to compost better.

One day we will begin to see that understanding and enthusiasm on a community scale.

Appendices

Grow Your Own Course Programme

Day one

10am	Welcome, introductions and expectations. What have folk grown before?
10.35am	Oops! Where did all that rain come from? Climate change and the current situation & why we want folk to grow more of their own
11.05am	Break
11.20am	The New Age Gardener Thinking about growing
11.50am	Stake your claim Creating a growing area. Planning, orientation, protection, size, layout etc.
12.50pm	Lunch Please bring a packed lunch; tea, coffee, hot water available
1.20pm	Stake your claim Continued
1.50pm	Dishing the Dirt Soil types/structure, PH, lime, feeding, drainage, preparation, no dig, mulching, rotation etc.
2.50pm	Break
3.05pm	Sow and grow Sowing seeds, germination times & conditions; light, warmth and water
3.50pm	Summing up, questions, next week

Day Two

10am	Welcome back and refresh
10.25am	Good Grub Reducing food waste & composting
10.55am	Name That Veg! The huge range of vegetables that grow in Shetland
11.05am	Roots & Shoots Which parts of the plant do we eat and the difference it makes to how we grow them
11.25am	Break
11.40pm	Roots & Shoots Continued
12pm	Potting On Thinking about what can grow where and when. Planting up the growing area
12.30pm	Potting on Continued
1pm	Lunch Please bring a packed lunch, tea, coffee, hot water available
1.30pm	The Cutworm and The Crow Pests, diseases and solutions
2.45pm	Break
3.00pm	Wicked weeds Weed identification and control

Carbon Classroom Growing Your Own Course

Evaluation of all four courses

Overall the evaluation was extremely positive with participants enjoying the learning. Climate change information was a little less enthusiastically received initially (see 'Oops! Where did all that rain come from?' below). However, from our full project evaluation we see that most people have embraced reducing their carbon footprint through food production, food choices and cutting waste.

How did you find the:	Very poor	Poor	Okay	Good	Very good
Pre-course information		1	3	14	24
Course content				4	38
Group work			3	5	33
Course handouts				5	37
Trainers				3	39
Venue			9 (cold)	18	14

More specifically how useful was:	Not useful	Okay	Very useful
Oops! Where did all that rain come from? Climate change and the current situation	1	23	19
The New Age Gardener Thinking about growing		4	20
Stake your claim Creating a growing area. Planning, orientation, protection, size, layout etc.		6	35
Dishing the Dirt Soil types/structure, PH, lime, feeding, drainage, preparation, no dig, mulching, rotation etc.		3	39
Good Grub Reducing food waste & composting		11	29
Name That Veg! The huge range of vegetables that grow in Shetland		1	24
Roots & Shoots more about veg		4	37
Potting On Thinking about what can grow where and when. Planting up the growing area		5	37
The Cutworm and The Crow Pests, diseases and solutions		4	38
Wicked weeds Weed identification and control		2	39

Please tell us about anything you particularly liked about the course:

- The varied group activities. The openness of the presenters, their knowledge and enthusiasm. The fact that Turriefield is very local. Info from research.
- This was aimed at every level of people attending. The teachers were both very helpful and full of useful information
- The balance between 'lecture time' and participation. The content fit the target audience well. Trainers prepared to look at individual questions and problems.
- Planning the space-helped me think about the space I have and what needs to be done
- Great chance to talk about 'things that work' here in Shetland. Lots of practical tips. Great handouts.
- The group work activities i.e. 1 creating a growing area exercise—really made me think about planning our garden/growing space and taking all factors into account. 2 pH testing—as doing this made me realise it was not terribly complicated (i.e. I could do it). 3 pest-being given pests to research and share presentations—good for helping remember about them
- change from listening to groupwork
- Course was very accessible. Trainers were always willing to answer questions and share their experiences
- really informative and helpful advice, the planning exercise was really useful
- Easy to understand, informative, friendly and helpful leaders. Course has made me feel more confident about trying to grow my own veg/fruit
- very much enjoyed the course
- good interactions to learn and keep it interesting
- answering on any questions popping up, information about own experiences of trainers
- The mix of participants and activities where we learned from each other. The pace of the days. The icebreaker 'cos it was also a 'grow your own' learning experience as well as getting to know people etc. etc.
- Lots of information gleaned from experience
- The broad base of the course but especially info about planning and soil testing and how to improve it
- Hints and tips for growing in Shetland. Wide range of information given. Handouts
- Just about to put up polycrub, really good for me as a starter.
- Having someone tell us about their experience of growing in Shetland
- Lots of useful tips and advice. Group activities got me thinking about my own area and where to start.
- Different activities kept it interesting. Being able to ask questions at any time, accessing knowledge of Penny and Alan's experience, being able to look at all those gardening books
- Very good presentation-clear, informal, responsive to audience, good size of group, excellent ethos—informality but also well structured, very good mix of discussion and activities
- Very interesting and informative
- Information and knowledge
- Discussions & meeting other growers
- Planning an & garden
- Soil testing
- Enjoyed mixing with other folk interested in growing veg in Shetland
- The active learning aspect and groupwork
- Very wide ranging, easy going, informative
- Structure enabling, interaction, mix of "activities", Questions & answers, knowledge of Shetland conditions and solutions
- It was very comprehensive-covered everything needed to start growing
- Very friendly and laid back; full of useful information, inspiring!
- Lots of very user-friendly ideas
- I liked the planning + information about what is good to grow in Shetland. Good to meet other people who have knowledge to share
- Learning about different soil types and how to enrich them for use. Composting
- Didn't assume any prior knowledge, well delivered, what plants need, which conditions
- Lots of useful interesting information. Made me think about what I could grow & how to get started. Very friendly and informal class
- I liked hearing what options you have to grow in Shetland & the considerations you have to make based on your site.
- Variety in not sitting all the time

Please tell us what we could do to improve the course:

- The hall was V cold the first day
- Potentially contact details from other members of the course. For further discussion/or chat forum for future questions to provide continued help and advice for local folk (just an Idea)
- Think the balance was correct
- Nothing
- Nil—all excellent
- Probably speaking a bit louder
- Colour pictures of the weeds! Seriously, it was all very good
- Learned a lot
- Would be interesting to see a site visit
- Continue it
- Nothing I can think of
- Maybe make it fruit growing as well as veg
- Can't think of anything
- Enjoyed it all
- Can't think of anything
- N/A
- More cups of tea—only kidding! :-)
- I can't see how you could!
- The first group work was unclear as to what the parameters were (I was not there at beginning)

Please tell us how you will use the learning you gained from the course:

- I will decide what is 'success' for us growing certain things so that we can move on from there—maybe salad beds first, some rhubarb and soft fruits
- Start my own vegetable plot and use the greenhouse to its full potential
- We will be attempting to grow using a greenhouse and outside plots
- I've started planning the space I have and digging space for a new veg/potatoes
- I will try to be a little more structured and organised with my growing attempts. The course has re-motivated me!
- -planning and planting my vegetable plot-weed more confidently-plan for pest control in advance
- Try to use it in my veg garden
- Will be much more active in the garden and will use books more
- By attempting to start growing things!
- I plan to try growing some vegetables for the family and hopefully encourage the kids to eat more fruit and veg. I would like to try to become more self sufficient
- Many thanks
- Hopefully to proceed to successful growing and composting
- Try to grow more plants
- 1 confidence to grow-I know where to get started and it's not the end of the world if it doesn't work and having someone to consult if things go wrong or need more info. 2 to think about recycling/working with nature and living more lightly
- I now have a better idea about all aspects of growing veg. Will now get started in own garden.
- The grid showing when to plant each thing will be very useful. I will have ago at growing aubergines.
- Hopefully try to grow more vegetables and try different kinds
- Improve range of veggies, treat my soil, compost more!-made another compost bin
- Will try to put this into practice
- Be more adventurous in crops grown
- Better idea of what to do-more successful growing. Hope to extend & grow & quantity
- I intend to re plan the garden (on permaculture principles as far as possible) as it has been neglected for a number of years while building work was done. The course has given me enough knowledge to be able to, at least attempt to, grow more of the food we use
- Plant more outdoors
- Start growing more veg!
- Get growing again, better weed control, use organic fertilisers, available locally such as seaweed from the beach, think about getting a poly-tunnel
- inspired to start growing
- To try growing more than tatties
- Continuing my poly-tunnel exploits, and growing more unusual plants
- Better planning of the growing area, future ideal growing conditions etc.

- Start growing our own!
- Loads! Protection/barriers, varieties that grow in Shetland
- I intend to have things growing in raised beds
- I will try and grow my own this summer!
- I will consider what I have learned when planting etc. from now on & perhaps understand where I have gone wrong in the past
- Begin to plan + start growing area, become more self-sufficient. Hope to get a poly-tunnel. Compost. Recycle more
- I will start composting
- Planting up my own plot-understand more re: rotation, keeping soil healthy & productive
- Start to grow more. Improve my composting-more food waste
- Aiming to get my own poly-tunnel
- Incentive to start growing

Any other comments?

- The fact that your knowledge comes from experience, you are a 'working together' couple and that you are still learning is fantastic.
- Thank you—really enjoyed it
- Thank you. Very knowledgeable trainers and enjoyable course
- Thank you very much for applying for funding and running this and sharing your knowledge with us
- Thank you for the time you put into running and on preparation. Interesting course.
- Very informative and interesting. Especially as I had never seen a gardener of sorts before. Thank you
- Thank you!
- Excellent, vexed I missed the first afternoon
- Thank you for an extremely informative course and a friendly and welcoming atmosphere
- Feel inspired by the course. Really informative
- Very inspiring! Would be interested in coming to another course when I have more questions and problems to solve. Thank you! ☺
- Thank you very much
- Thank you very, very much for an excellent course which I really enjoyed and have profited from. I hope we will be able to attend a second level course in the future?
- Thanks again
- Thank you very much it was a pleasure to meet you
- Excellent, thank you
- Very interesting
- Thank you, very informative and fun.
- It was Fab, thank you :)
- Thank you
- Many thanks, very motivational!
- Excellent course
- Keep up the great work! Thank you!
- Very enjoyable course-useful and professionally delivered
- I really enjoyed the course. Thanks.
- Thanks very much I have really enjoyed my 2 days. It has inspired me. You are both very positive and really know your stuff. Thanks Again.
- Lots of hot drinks appreciated, although the heat in the room would have been nice :) It's astounding that it's all free!

In the morning I woke up, had my breakfast then I went on the school bus.

When I arrived at the school I was excited that we were going to Turriefield. Turriefield is in a way a croft.

When the bus to Sandness came to the school we hopped on board. On the way Nathan was singing songs like the 'Duck Song', which was silly. I was speaking to Paul and Tom. It was quite amusing actually. The bus was so slow it felt like I was riding a slug.

When we came to Turriefield the weather was fire hot. The workers gave us a sheet, the thing we saw we had to mark on the sheet.

First we saw turkeys and the dog was awesome because he could shrink his nose. We saw piggies as well!! People's snack was chucked to them just the apples though. They were sooo cute. They dig the ground with their noses as well to help make it easier for the work to plant seeds.

We saw tatties, carrots, parsnips and brussel sprouts. They were epic.

We saw ducks next, they were fluffy noisy. They are really good for the farm because they eat slugs.

Then we saw vegetables in the polytunnel. There were pumpkins chillies and melons. How epic is that you can grow melons in Shetland!!! After we saw the berries for instance strawberries and lots of other berries. I love strawberries.

Then we had to wash our hands with the soap they made. It amazed me.

I enjoyed seeing everything.

It was time to eat dinner at the Sandness School. A teacher took us out to the back of the school so we could eat our lunch. I had lots of yummy food like melon. Then the Sandness teacher said we could go to play in the playground. It was lots of fun, especially playing football with Murray.

Then we put sun cream on but before that I thought I was already sun burnt. As I was so red. It was time to go home at that point.

Back on the bus, Paul, Tom and I were speaking about fishing and Tom's boat. On the way back Nathan was singing songs. Very irritating.

Once we arrived at the school I had to go straight on to the bus. Paul and Emma came to our house after I was telling Mam what a fun time I had.

Lunnasting Primary School cook book

Made as part of their Food for Thought Project in which Transition Turriefield were partners and the Carbon Classroom provided information and learning:

