THE PERMACULTURE ASSOCIATION

TEN YEAR FOREST GARDEN TRIAL

YEAR 5 REPORT

October 2016

by Silvio Volkmann

Ten Year Forest Garden Trial; Year 5 Report
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Cover photo: Edibles Forest Garden – Summer 2015, abundant produce in a former open field

The Permaculture Association has as its mission 'to empower people to design thriving communities across Britain, and to contribute to permaculture worldwide'. Its vision is 'an abundant world in which we care for the earth, each-other and future generations, whilst living within nature's limits'.

The Permaculture Association is a company (05908919) and a registered charity (1116699 and SC041695).

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… and the generous anonymous donors of the initial project funding

Above: A view of the Kerswell Forest garden in its landscape context. Shelter belts can be seen in the foreground from the ridge above the site.

INDEX OF ABBREVIATIONS USED

TYFGT	Ten-Year Forest Garden Trial
PA	Permaculture Association
FG/s	Forest garden/s
FGP/s	Forest garden project/s

1. Foreword, *by Chris Warburton Brown, The Permaculture Association*

In 2010 two anonymous donors gave a total of nine thousand pounds to the Permaculture Association to conduct a ten year research trial into forest gardens in the UK. The idea was to give half of the money to a dozen newly established forest garden to help cover their set up costs, and to use the remaining money to monitor their progress and evolution over the following ten years. This report marks the half way point of that project. It reports on the progress of the forest gardens in the trial, and on what has been learned so far.

The 10 year trial has been both an opportunity and a challenge. An opportunity to create and study new forest gardens over a long period, and to draw clear conclusions that can help future forest gardeners. A challenge because there was never really enough money to properly fund the research, and because when the project was designed the Association lacked expertise in running research projects of this kind. These two opportunities and two challenges have run through the whole trial so far and appear throughout this report.

Sometimes it has felt the opportunities have outweighed the challenges and sometimes the challenges seem to have outweighed the opportunities. Ultimately we have successfully followed our small group of forest gardens from creation to semi-maturity, and this report certainly delivers some clear conclusions that will help future forest gardeners. This success is largely due to the endeavours and determination of the forest gardeners themselves and to the excellent research volunteers that have worked on the project; Celia Ashman, Barney Thompson, Jon Warrington and Silvio Volkmann. Silvio has done an outstanding job pulling this report together.

But it is fair to say that we have not yet achieved the full potential of the project. In particular the shortage of money has meant it has not been possible to bring the forest gardeners together face to face or to create a strong and supportive network for them. Because we have relied on volunteers, the Association's support for the project over the last five years has been inconsistent. At the start of the project, the intention was to begin with loose research aims and then firm these up through a participatory action research process with the participating gardeners. However, the wide geographical spread and limited budget made it difficult to bring practitioners together to develop this aspect of the project.

This report shows that the project has certainly been a worthwhile undertaking. Much has been learned, and that learning will be of considerable benefit to future forest gardeners. Arguably the most important thing about the project is its existence, making a clear statement that UK forest gardens are worthy of study. In this sense the project was certainly somewhat ahead of its time; published research on temperate forest gardens was almost non existent six years ago but is now starting to emerge, and the recent creation of the Food Forest International Research Network will surely speed up that process. Hopefully it will be only the first of many such studies. In this way it has proved very valuable. I hope the detailed information and advice in this report will also prove very valuable for all forest gardeners, whether new or experienced.

What of the future of the trial? The project budget is now fully spent, but we remain keen to deliver a strong conclusion to the project in year 10 (2020). We will therefore be fund raising to support this work. In particular, we are keen to ensure that all the gardens in the trial (even those that are no longer actively participating) are visited and full photographic, biodiversity and yield records are made. This will enable the production of a high quality final report presenting a range of both anecdotal and scientific observations, and drawing strong conclusions on what has been learned from the trial.

If you have found this report useful or inspiring and would like to discuss the way forward for the trial, please email me: research.@permaculture.org

2. Introduction

2.1. BACKGROUND

For background information it is useful to have a look at the “Year 3 report” (Remiarz 2014) before reading this “Year 5 report”. The earlier report provides the full background to the 10 Year Forest Garden Trial as well as the development and results from the first three years. In 2013 the objective of the trial was adapted because of some unanswered questions, particularly a need to define the precise research focus of the project. Due to this the project became more open-ended and exploratory in order to establish the direction of the further research.

A brief overview of the 10YFGT project

- Goal for year 3: Complete round 1 of data collection and initial evaluation
- Goal for year 5: Complete round 2 of data collection and deepen evaluation
- In year one of the study, three distinct user-types of FG were identified within the study group (with different ways of recording required):
  - Private FG – designed to produce a wide variety of different crops
  - Community FG – social yields like learning and people's involvement might be as important as what is actually harvested
  - Commercial FG – guilds may be designed around a few major commercial crops
- By completing the year 3 report the aims of the TYFGT were finally in place as the basis for the workplans in year 5 and 10:
  1. *To improve the ability of the Permaculture Association, project participants and other forest gardens practitioners to design and undertake research into forest gardens systems.*
  2. *Through the process of achieving the above, to better enable project participants and other forest gardens practitioners to achieve their personal goals.*
  3. *To improve understanding of forest garden systems in different social settings.*
- Setting these aims made possible clear methodologies and the gathering of data in a systematic fashion.
  - M1: Investigate diversity and abundance of a wide range of social, environmental, productive and economic yields in different social settings over time (including the measurement of inputs and outputs, crop yields, biodiversity and soil quality), as well as qualitative and (where possible) quantitative assessment of personal and community benefits

- M2: Facilitate participatory design of a long term FG research project, with outcomes at both operational research and project management levels (including the development of user-friendly research methodologies and methods of sharing these methodologies and their results)

- The intention was that participants' own project goals should be stated as a set of comparable goals for every participating project. However this process was not finished in 2013.

2.2. OBJECTIVE OF THE YEAR 5 STUDY

As mentioned above, the goal for year 5 was a second data collection phase as well as an evaluation of progress. Actually only the latter has been done. The reason is given in chapter 4.

This report considers the development and changes of the participating FG within the last two years. Essentially it is about assessing the satisfaction of goals around yield, community involvement and maintaining effort – the key issues, depending on the user-type or FG objective (private, community, commercial). Our hypothesis is a simple one: yields should have increased after several years of establishment, community life should be stronger and richer, while in contrast the maintenance effort should be decreased. Associated are other points of interest and their changes, such as finances, learning experiences, recreational value, biodiversity, soil quality and personal opinions. Finally, there are potentially other unexpected outcomes, benefits or struggles. How these have developed is shown in chapter 3, Results.

Kerswell Forest Garden early in its development

Kerswell Forest Garden in 2015

3. Methodology

3.1. LITERATURE AND PROJECT RESEARCH

In preparation for this report there was full research of the already existing material. This included the site descriptions, interviews and reports made up to and including 2013. Furthermore there has been an extensive literature review of terms like agroforestry, forest gardening and permaculture using the PA library. On this basis, the questionnaire was prepared (see Appendices). The open questions, focused on changes and observations, were chosen in such a way that the interviewees were able to potentially cover these key aspects:

- environment (soil quality, hydrologic balance, biodiversity, micro-climate, windbreak, resilience)
- maintenance effort (productivity, weeds, seeding, irrigation, fertilising, resilience)
- outputs and costs (commercial success, labour, waste, pesticides, fertiliser, energy, water, tools, increased property values, resilience)
- health (recreational value, well-being, awareness, diet, crop diversity)
- social (community building, networking, connecting of stakeholders, integration, organisation, responsibility, resilience)
- education (craft skills, environmental awareness, knowledge, knowledge transfer, research)
- and the links between these points

3.2. SCOPE

In 2015 seven in-depth telephone interviews were conducted as source material. Of the 10 sites involved in the study:

- 1 site had both phone contact and visit in person (Edibles)
- 6 sites had phone interviews
- 1 site left the trial (Rifleman Cottage)
- 2 sites are still involved but proved difficult to contact (Black Mountain Development Project and Steward Community Woodland).

As a result, three of the ten telephone interviews could not be done:

- Rifleman Cottage in Kent dropped out of the trial due to domestic challenges. Subsequently the site owner who established the forest garden left the site in 2015. Neither he nor his son who is now managing the site has been able to proceed with

the trial. The forest garden is not the main part of the site. And, it was not possible to get in contact with the site owner again.

- The Black Mountain Development Project in Bradford is still part of the trial, officially. That means there has been no other, contrary statement. But the person in charge has changed. It was very hard both to find that out and to get in contact with her. She does not know anything about the trial nor is she interested in it. At this time there was no chance to find out more.
- The Steward Community Woodland in Devon is also officially still part of the trial (no other, contrary statement has been received). But it was very hard to get in contact with the person in charge. What emerged in February 2016 is that the community living and managing the site is under incredible pressure facing the threatened loss of their site and home. Obviously this is not the right moment to proceed with the trial.

3.3. DATA COLLECTION

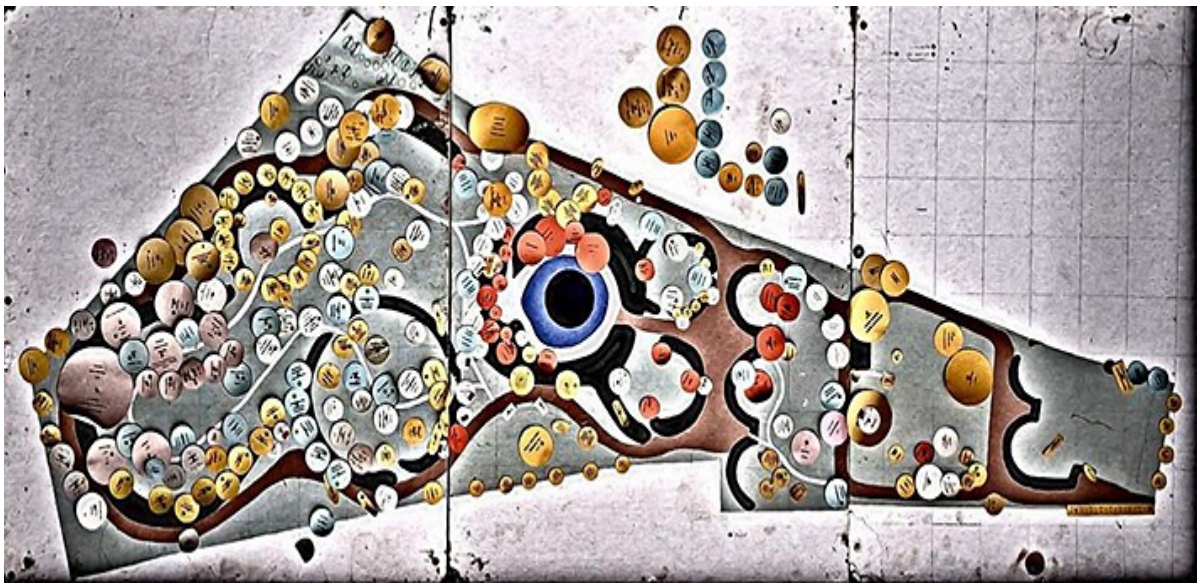
The TYFGT was designed as a participatory research project with two primary research methods for data collection: on the one hand quantitatively in form of measurable quantities such as crop yields, on the other hand qualitatively in form of interviews. The intention was to do this after three, five and ten years. This was to be achieved through telephone interviews of all 10 FG in the project, with an emphasis on collecting data that would shape the future direction of the project.

Actually, across the whole project the quantitative data collection, even the main idea of the participatory research, fell behind. According to their own statements all participants stopped keeping records after three years due to lack of time and a clear guidance regarding What and How. Apart from the initial set up grant, none of the FGPs were paid to take part in the trial or to keep records, and staff resources at the PA to support this project have always been limited.

Therefore the only possibility to document the progress so far was a qualitative survey in the form of telephone interviews. The duration of the interviews were between 30 and 45 minutes and they were conducted at the end of 2015. The interviewees were the participants in the TYFGT; the persons in charge who established the FG and / or those who currently maintain it. There was a great richness in the detailed responses. As a result, detailed analysis of the telephone interviews has been carried out.

3.4. TOOLS AND DATA ANALYSIS

For conducting the interviews the following technique was used: phone or laptop with the software Skype®. In order to record the talks the software Quicktime® was used. After transcription, data analysis was carried out. Misplaced responses were moved to the corresponding questions and repetitions deleted. Subsequently, common, similar and noticeable issues were summarised. Significantly differing information, such as individual strengths and challenges, were subjected to a separate consideration. In addition, where possible there was a comparison with the results of a very similar telephone survey from 2013, plus the face to face interviews and site visits conducted in 2013, and the Year 3 report. This work's challenge was to ensure comparability despite the huge range of characteristics and conditions. But, the weakness can be a strength too. This trial also shows the adaptability of FG to different characteristics and conditions. Finally all of this was compiled into this report.



Kerswell Forest Garden – Site design

4. Results

4.1. YEAR 5 STUDY – SUMMARY

With the exception of one issue, the current project needs have not changed since 2013: more time, more money, more volunteers and ecological surveys. However, networking with the PA and other partners in this project have not been mentioned any more. Approached on that issue, some participants said that they do not see any benefit in collaborating with the PA. In addition it has turned out that there is in some cases the wish for generating an income from a private forest garden. The interviews show, that the FG are generally evolving well, even if there are struggles or weaknesses. Presumably this is due to the hard-to-evaluate potential of the practitioners, the sites and other influences. Sometimes things have developed better than expected.

The FG must reach a certain age in order to ensure that tree and shrub layers have become mature enough and have got a proper level of their specific function, especially related to the benefits of micro-climate. After five years not all the FGs are in this condition. This means that not every site has developed its full potential by year five. This also means that this Year 5 Report is still not able to show the full strength of these FGs or of forest gardening in general. But, most likely the final study in year ten will be able to do so.

The major successes up to 2015

- steady progress of the FG projects and partially finished establishment
- higher yields
- high improvement in biodiversity and soil quality
- significantly less maintaining efforts
- successful propagation of plants
- improvement in volunteering and community involvement
- improved knowledge and personal skills
- more educational activities
- beautiful place for recreation
- good designs
- creation of resilient, sufficient garden systems
- improved micro-climates
- relatively high satisfaction

The major weaknesses up to 2015

- lack of time
- wind-damaged trees
- still struggling due to a lack of ground preparation in the initial phase – in majority weeds
- lack of volunteers
- lack of community involvement
- no or hesitant planning permission

General advantages of forest gardens

As mentioned above, this study's challenge is the comparability of data between sites due to the wide range of characteristics and conditions. Even so, the successful progress of the majority of sites proves the adaptability of FG to different characteristics and conditions. Where conventional agriculture or gardening fails, especially on sloping or very small sites, a concept such as a FG, simulating natural ecosystems, is able to match the needs of humans as well as nature. As a result of this the year 5 study suggests that the -benefits of FGs are in general:

- lower costs
- lower input of energy, water and materials
- lower maintainance effort
- lowest waste production
- reasonable yield
- rich social life
- higher biodiversity
- higher recreational value
- rich personal development

Recommendations for new forest garden practitioners

A big outcome in the Forest Garden Project Report for 2013 are recommendations for new forest garden practitioners. Considering this, there is hardly anything to add in this report for 2015. Many of these insights, gained within the first three years, have been very useful for the progress of the trial sites. Over a longer period of time major mistakes in the initial phase, the site evaluation, planning, design and planting, can be extremely difficult to cor-

rect. How that looks on specific sites will be shown by the detailed elaboration of the interviews below.

General recommendations from the 3 and 5 year interviews include:

Design

- its all in the design – understand the land and micro-climates of the site and plan accordingly
- start with a small size and keep the design simple to get it managed
- work from patterns and designs
- stay focused on the long-term major goals of a FG:
  low input (money, energy, material, maintenance)
  high output (self-sufficiency, resilience, recreation)

Site preparation and maintenance

- where necessary, ensure an adequate means of irrigation
- ensure decent ground preparations and windbreaks
- start with windbreaks
- ensure correct spacing is planned for when the trees are fully mature
- put in ground covering canopy early to prevent weeds from re-establishing themselves
- black sheeting can prevent weeds from re-establishing themselves
- make long lasting and sturdy fences
- ensure there is adequate protection from rabbits and other pests

Budgeting and cost savings

- budget properly as trees are expensive
- source seeds and plants locally or relocate plants from other areas of the site or by making exchanges with other gardeners
- designate an area of the site for growing and generating living mulch
- ensure that there are enough volunteers in the initial phase – they are crucial to get the major work done

Ongoing Learning

- join forest garden networks
- adaptive management – be creative and adaptive as nature is

Edibles Forest Garden – March 2015, mulching with cardboard

4.2. ELABORATION OF THE INTERVIEWS

4.2.1. Satisfaction factor

Aked whether they are happy with the progress of FG, four of seven participants answered that they were happy or very happy. These sites are really good examples for achieving the benefits of a forest garden, even if different requirements have been met. Key features of these projects are thorough site analysis and preparation, establishment of a great variety of plants and layers and the creation of a functional social network, with family members or volunteers contributing significantly to the development of the site as well as to the well-being of the stakeholders.

One participant expressed ambivalence, seeing benefits whilst facing struggles ("Some years are good, some aren't."). Two forest gardeners showed disappointment due to struggles which can't be beaten by the gains. The major struggles resulted from insufficiently prepared ground, design mistakes (FG too big), from health or domestic issues or harsh site conditions like strong wind, soil acidity, steep slopes or a remote location. Another issue that was revealed was the lack of focus, creativity or flexibility in order to over-

come these challenges. Some practitioners have difficulties to use the opportunities the sites offers.

Finances are a big problem for many; this aspect of a garden project depends on whether the site can ensure a livelihood or only self-sufficiency. One forest gardener displayed an incredible prospering zero maintenance garden created from just £12, but sadly he also stated that his plants are overgrown now because there is nobody any more to harvest the produce. It is an unused site today.

4.2.2. Changes of objectives

Substantial changes in design or objectives were quite unusual, because the intention of creating a food forest basically met the wishes and needs of the stakeholders. Additionally, any major changes were likely to require much effort. Due to this, at those sites where changes were necessary or even inevitable they generally occurred as adaptations to changing conditions or initial design mistakes rather than radical changes.

In the best case the intention was simply to establish a zero maintenance polyculture for the gardener's parents, and his aim has been successfully met. One participant expressed that the forest garden's objective was quite unclear in the beginning because it is part of a much bigger site run by a trust. Today, integrating it into the whole site has given the forest garden a more educational and recreational character with big potential for community building and as a venue for charities.

Another participant stated that the initial objective has changed from mainly self-sufficiency and recreation into running courses. Causes of this change are health challenges as well as breaking up with their original partner which has restricted the ability to do sufficient physical work. At another site health issues were a significant reason to simplify the design because the stakeholder was not able to establish a productive ground layer. Chickens have been introduced to compensate for the poor ground layer and promote the soil fertility. Furthermore the site's traditional orchards have been transformed into poly-cultures, while the initial forest garden area has become an additional apple orchard with many apple varieties. This example shows by far the biggest physical changes within the trial.

In one case it emerged that the small forest garden which provides a very small harvest is able to supply the entire farm with fertiliser from its main crop. The objectives have

changed from the creation of a food production space to increased biodiversity and resilience as well as to an educational use.

At several sites, the owners or the main person(s) managing the site changed over the course of the trial so far, as well as the capacity to manage plantings due to health issues in two cases. This showed knock-on effects on the productivity and usability of sites. This indicates the need for contingency planning and anticipation of change in the design stage.

4.2.3. Development of yields

At this point it is hard to say how meaningful changes and trends in yield are. Clearer trends should be visible in year 10 of the trial. The development of yields between sites is very varied. Although mostly not monitored quantitatively, yields are something where change is obvious to the gardeners. Three of seven gardens show a distinct increase of produce, especially of fruits. Descriptions range from “heavy yields” and “better than expected” to “incredibly high amount of fruits, lots of different greens and medicinal plants”.

Three sites provide both an increased yield of some species or varieties and a decreased yield of others. Interviewees said: “A few more apples...It is not a great year.” or “There are few things that has a fairly disappointing yield such as apple trees...But everything else…is really good.” One participant of the trial stated that there has not really been a yield yet because of the heavy wind and drought that decelerates the grow of the trees.

Kerswell Forest Garden - Abundance, an astonishing yield of Mirabelle plum, variety 'Ruby' (a branch is broken due to excessive weight)

4.2.4. Community involvement

The community as the social aspect of a forest garden contributes to the stability of the whole system as it enables financial independence, high flexibility in maintenance and a reduction of individual workloads even in the period of establishing. In fact many stakeholders depend more or less on volunteers in terms of physical garden

work. Five years after the establishment of the forest gardens there is still need for volunteering work, especially maintaining and harvesting.

In general the trial participants state that there is no or little increase in community involvement. By their own account the main reason is the remote location. In two cases there seems to be no need for outer help because there is little to do any more. The sites are small and now fully established. Only one site gets more and more volunteers helping in the garden. As well sleeping facilities are very beneficial to have residential volunteers.

In order to receive enough help, of importance how attractive the forest garden is. The remoteness of a site is important, as are values like diversity or variety, design and cultural events. Overall it was obvious that community involvement is a big challenge for the practitioners.

4.2.5. Finances

The financial aspect is a very important one, because money is crucial to our modern way of life and so forest gardeners depend at least on breaking even. In the initial phase a lot of money was spent on new plants, especially trees. Five years later, in general the trial shows a mainly successful financial outcome; the majority of the participants express that they are satisfied or even excited. One is happy about getting more funds from elsewhere to buy more trees. Three practitioners said that their FG has not caused any costs after establishing. One of them even intended to show that a prospering forest garden does not need lots of money; in addition to the trial grant of £500 he spent only £12 for a grey water treatment system. The trees and plants at his site came from different places, from making exchanges with different people.

Kerswell Forest Garden – Natural pond

Contrary to this, two people expressed a lack of any financial income from the garden due to health challenges or a very small yield. One practitioner outlined a fairly balanced image of her finances. Self-sufficient in fruits and propagating trees, she was able to sell some

trees. Otherwise many tree species at this site have difficulties and do not grow well. Manufacturing and selling jam has been a source of income but the profit margin is too small. There is a need for investing in facilities to be able to process produce professionally. In general all kinds of financial support are welcomed by the forest gardeners; sometimes it can be a gift like a freezer for storage.

4.2.6. Micro-climate

Three of seven practitioners can observe a well balanced micro-climate at their site, warmer in the colder seasons and cooler in the warmer seasons. The balanced micro-climate gives less stress to plants as well as a longer growing period. These qualities evolve due to the different layers of a forest garden, ponds, raised beds and banks with alcoves. However in four gardens there is little noticeable improvement because of heavy wind, the slow development of the trees and still low plant density.

4.2.7. Biodiversity

All the participants are very happy about biodiversity. They state that it has increased noticeably due to the creation of many diverse habitats. Observations at a former overgrazed pasture field are that the wilderness has come back with orchids, great insect life and very abundant butterflies, dormant for many years. Another practitioner describes the presence of owl families with offspring in the orchard-like forest garden. In a suburban forest garden a vanished spider species and hedgehogs are showing up again after absence for decades. Native hedges are well known to increase biodiversity, as can be observed at another site where before there were no small garden birds at all, because of the big open site. Finally, the sloping site with terraces seems to be a really good habitat showing a huge variety of insects and amphibians.

Stepney City Farm , London- The smallest FG in the trial

4.2.8. Soil quality

The soil quality of a forest garden is supposed to improve over time because of the imitation of natural cycles. It is a really good indicator of a healthy garden. All but one of the participants have been able to notice an improvement of the soil after five years. Despite sometimes harsh initial situations they talk about massively improved ground. Soil which was never good for food growing before, very stony or sandy with very little water holding capacity has turned into a very healthy one with a much darker colour, a better texture, a high level of organic matter and many worms.

4.2.9. Maintenance efforts

The maintenance efforts for a forest garden are supposed to decrease over time. The imitated natural system should become a nearly self-sustaining one almost like nature itself. The principle is: the more established it gets the less maintenance it requires. It does seem that this is generally the actual result. Plantings have been finished fully or most widely after five years. Many interviewees stated that they have now low maintenance with low input.

The amount of work in some of the forest gardens has dramatically decreased. Some of them don't need to irrigate or move compost any more. In the case of the backyard garden the dry areas of the site are watered by a grey water system. Elsewhere there is still only the need for cutting grass, for some weeding, pruning or mulching around trees until they are mature, just a question of time. Many of the so called weeds are in fact useful with the result that they are even used in the kitchen or for medicinal purposes. Regarding the remaining unwanted weeds, there is more ground cover taking over allowing less space for them. However at a few sites there is still a high need for maintenance due to heavy wind, deer or nettles.

4.2.10. Struggles and weakness

Compared to the successes of the FG it turned out that the challenges the participants have are mostly manageable. Everything is quite educational for the ongoing progress and for new projects. Mainly it depends on two factors, time and labour, even at those gardens where establishment has not yet been finished. In individual cases there are particular challenges like planning permission, health issues or the lack of volunteers to do heavy work. Greater struggles described by interviewees include steep slopes combined with adverse site exposure to wind, or keeping the amount of grass under control. There have been mistakes too like over-planting. In one case a big weakness is the small design which does not

allow a big harvest. One interviewee states that there are no struggles or weaknesses at all, and another does not see any major problems.

4.2.11. Gains and strengths

For all the interviewees, the gains and strengths outweigh the struggles and weaknesses. In general the FG are very productive with a good effort-yield-ratio reported, and a pleasing place to be. A field that was previously pasture turned to be very alive in every sense and rich in colours; an ordinary suburban garden turned into a wildlife haven full of food for the owner's family. One forest garden provides all of the fertiliser the whole garden site needs. Another practitioner looks on his artistic skills and his raised awareness for life through his health challenges as the biggest gains and strengths. Many interviewees expressed that their learning experiences and insights are highly valuable. Even if a forest garden is established only once, it is a changing system with ongoing processes and can be still adapted. So different parts of the site benefit from the experiences gained from another part, or from an earlier stage of development.

Edibles Forest Garden – 6 years ago, a demonstration patch near the road, mulch of manure, leaves, grass, cardboard etc has formed a deep soil

Edibles Forest Garden – 4 years after planting out this 'domestic scale' FG there is a good yield from apple trees, mulberry, blueberries, rhubarb, black and redcurrants, lavender, borage, chard.

4.2.12. Personal skills

Some interviewees started with existing advanced garden skills and did not learned anything new, but most were clear that their personal skills had greatly improved over time. Many participants have learned more about plants and how to flexibly use nature's benefits.

There are many ways of learning. Some skills are just learned by doing, as one interviewee said: “I am impressed with myself on pruning; I taught myself.” Another case shows how tree grafting and cutting bring greater success if learned on a course. Furthermore, just doing garden work and talking to guests like volunteers improves the ability to teach. The work in the forest garden also makes people more aware of analysing other sites and of project development. It is definitely useful in terms of constantly trying to think of ways of doing things better.

4.2.13. Education – Sharing of experiences or expertise

One great benefit of a forest garden is to share experiences and expertise with people who want to know how to work and live in harmony with nature. This is especially important in urban areas where sustainable life is a big topic; urban forest gardens are perfectly placed to meet the needs of city dwellers. Forest gardens can fit in every park, allotment and in nearly every backyard.

For many people, the best way to learn is through experience, a fact which makes hands-on volunteering mutually beneficial. Almost all the participants express that forest gardening really inspires people, including themselves. People are very interested to see and learn what a FG is. Some participants run courses about permaculture, forest gardening or general gardening, for all kinds of interested people with or without their own garden, for children, pupils and school teachers as well. These courses are given locally, nationally or even around the world, sometimes at festivals as well. Some are involved in diverse networks where they are able to share knowledge. And sometimes a researcher from a university appears at a site who does research on forest gardening and collects data.

Finally one of the interviewees is putting the huge range of experience and insight he has gained from his forest garden work into a book on orchard management from a permaculture perspective.

4.2.14. Record keeping

Except in the initial phase and except for taking a few photographs, the participants in the trial commonly don't take any other records.

The Quadrangle – Gooseberry pruning

4.2.15. Needs and wishes

The needs and wishes of the interviewees are as different as the sites are. In general the participants wish for a more beautiful, fruitful, diverse, mature and successful forest garden. Partially there is a need for more volunteers or labour for ongoing establishment or maintenance. Other voices wish for more time or money to do that. Another participant raised the need to run diverse courses in order to generate an additional income.

The wish for higher produce yield is very common, no matter if this is for personal need or for income generation. Sometimes it seems to be a question of patience, which can be challenging depending on the circumstances. Fruit trees and shrubs need to propagated and planted or just grow to maturity, as do natural wind breaks. These forest gardens can't yet exploit their full potential.

From the legal point of view, one practitioner is still waiting for planning permission for site workings. Another would like to own the land which is just too expensive; in this case there are strong restrictions from the landlord which limit the growing area available. Maybe because of this limiting factor there are some more wishes and needs: a proper nursery for propagation, a pasteurizer to keep produce all the year, and a small business making jam and chutney. Without these things this forest garden can't exploit its full potential, or become fully financially viable.

The Quadrangle – The pond, summer 2015

4.2.16. Future expectations

One participant trusts in his forest garden's development

as well as in his own efforts despite the struggles; he is confident he will be able to deal with the site's limitations like steep slopes and heavy wind. Another does not have any idea of the site's future. A third states pessimistically that he will continue to have problems with competitive grass instead of having a productive ground layer.

The majority of participants have an optimistic or very optimistic estimation of their forest garden's future. They are commonly optimistic, curious or positive and look forward to the changes ahead. It seems that most realise that nature needs to be understood, needs time to evolve, that one can hardly impose their own will on it, and that not every wish comes true. But nature surprises sometimes with something unexpected, useful or beautiful. Patience and working creatively together with nature will be rewarded.

5. Conclusion

5.1. PARTICIPATORY RESEARCH

One key objective of the participatory research initially was to keep records in order to have a scientific basis for research on forest gardening. As mentioned above since 2013 there are no records which the participants would be able to share. They said that they see two major issues: the lack of time and the lack of knowledge, what they express as “a lack of a very clear guidance”. Obviously the last point is more important then the lack of time. The easiest thing to do is just to take photographs. But also that needs a structure (subjects, weather, seasons and others) to ensure comparability or a clear documentation of the progress within a project.

In general the participants wish for clarification about what exactly the PA wants from them in return for the funding. One participant argued that at the first meeting they asked what kind of records the PA wants them to keep in each category (private, community, commercial). There was no form, it was too loose. They were not given clear enough instruction of what to record, he said. For example a commercial site owner as a business person would know very well his yields, and there is a need of much more yield than from a small scale private site. Because the livelihood of a business person depends on it he or she will put much more energy in it. In contrast, a private forest gardener does not really care that much because he or she would do it for love. So the yields would be very different. The participant who suggested this was sad about not hearing very much after that. Furthermore he said that he does not know where the trial is going next because there has not been much energy in it in the last four to five years. At the moment it would not feel like it is well coordinated. Another interviewee expressed the same view.

In the year 3 project report there was a comprehensive consideration and redesign of the methodologies, aims and objectives of the trial. For some reason a transfer of these new insights and developments did not happen. Furthermore, sometimes the practitioners just needed help to overcome a gardening related or site related issue. One participant expressed the need for the support from the PA and their peers to share good practice and research ideas (e.g. as a peer-to-peer network). The suggestions included funding to get all projects together in the winter time and for some kind of electronic forum or email list in order to get in touch with each other and to have an exchange. Furthermore two participants said they would like to have researchers at their site doing research.

5.2. RECOMMENDATIONS FOR THE TRIAL

The following recommendations for a comprehensive participatory research trial depend on the capacities of the PA and the associated experts. But, it would be very difficult to provide all of them. It sets out an ambitious vision of what is needed in order to support the laymen so that they are able to support the research efficiently. Some of the points are already covered.

Possible guidelines for participatory research:

- What - measurement parameter - *partially covered*
- When - dates of taking records - *partially covered*
- How - guideline or manual for laymen - *covered by:*
  - "The Permaculture Research Handbook" - Methodologies for measuring and recording yields, biodiversity and soil quality http://www.permaculture.org.uk/sites/default/files/page/document/smallhands-mall.pdf
  - "Permaculture Research: Soil Test Handbook" https://www.permaculture.org.uk/sites/default/files/page/document/permaculture_research_soil_test_hb_v.2.1_0.pdf
- Facilities - assistive equipment (e.g. soil test box, form sheets, online form for data entry) - *partially covered*
- Personal assistance by researchers or interns *partially covered*
- *Continuity of support: cannot be provided by interns but could be provided through allocating resources to members of the permaculture network who could learn valuable research skills by supporting the trial.*
- Peer-to-peer network *soon covered as part of the Food Forest International Network (FFIRN)*

5.3. METHODOLOGY

The act of doing an interview and the way it is done, naturally causes errors that are based on human psychology. On both sides, there is always a certain level of expectation, a preconception that can distort both questions and answers. For example, I have an affinity to the topic of forest gardens which could give the results a more positive perspective. An absolutely neutral survey is unfortunately impossible, but should always be an objective. I did consider this in the data analysis.

Another source of error is the fact that the questions are open. For specific questions it means that some respondents have not been able to give an answer. Only through redrafting the question or through giving direction by examples were those respondents able to answer. This might also be a source of distortion. Nevertheless, in such cases this was the only possibility to receive an answer at all.

During the analysis of the interviews I realised the lack of specific questions for taking records in order to match the aims of the trial. An adaptation would have been necessary.
Question 2 (changes of objectives) and question 3 (wish for doing any changes) are quite similar. Question 2 is ambiguous and correlates in some kind with question 3 but doesn't refer to physical changes. A better question would be: Have you made or are you going to make any significant changes in your forest garden?

Furthermore, it is not appropriate to draw scientifically accurate conclusions from this survey and make comparisons with conventional methods in agriculture and horticulture, as the latter are not the subject of consideration. Nevertheless, I drew some cautious conclusions where they seemed obvious to me as a result of my own experiences.

6. Outlook

As explained above the PA lacks the capacity to sufficiently cover the participatory research in the second half of the trial period of ten years. This means that it seems unlikely that any quantitative data collection will be carried out during the remaining five years of the TYFGT. This weakens the value of the study.

Nevertheless, I consider the study to be a success because it provides basic insights into forest gardening over a number of years, such as strengths, weaknesses and recommendations. Finally, after ten years, a final survey will be done, at a time when the forest gardens are mature and all layers have reached a sufficient level of functioning. This especially applies to the tree layer regarding micro-climate, windbreaks, biodiversity and resilience. So far, the gained experiences are already valuable sources of inspiration for many new and existing forest gardens. So the TYFGT has potential, especially in a final publication, to show people in the Western industrialised societies a functional, practical, affordable and sustainable alternative, in terms of living environment, food production, recreation, urban climate and others.

Edibles Forest Garden - making haylage

7. Lessons for Participatory Research, *by Tomas Remiarz, Technical Advisor*

From an Association point of view the trials lessons for participatory research are at least as valuable as those for forest garden practice. This was the second attempt at participatory research following the successful mixed vegetable trial in 2011, and the first attempt at a long-term study. It was an opportunity-led project, following the offer of a £9,000 donation for the purposes of researching forest gardens.

The short period between the initial funding offer and the beginning of the trials left little time to define goals, research questions and methodologies. Contact with participants was critically underfunded. There was little guidance regarding methodologies for recording yields, biodiversity and soil outcomes, and no ongoing support. The wide geographical spread made it difficult to bring people together, and the range of scales and settings resulted in a less meaningful sample because of a lack of comparability of sites. The use of interns resulted in a lack of continuity in contact between participants and coordinators. It also meant that the coordinators couldn't systematically build up their understanding of forest gardening in general, of the specifics of this trial and the specifics of the sites and people involved.

For this particular trial, Year 10 offers an opportunity to gather information on maturing forest gardens. If this is to be done successfully, it needs to be adequately resourced and prepared. Funding should be in place at least a year in advance, so as to give both coordinators and participants time to prepare.

Any future trial must develop clear objectives before sites are chosen, as these bear a large influence on the choice of participants according to their skills and interest. If measurements are to be an objective, it would be preferable to develop methodologies in advance, in a draft form that can then be tested by participants. If the objective is to develop the methodologies in a participatory way this requires a different set of skills and interests among participants, and a different allocation of resources by the coordinators.

Choosing a geographical cluster, rather than going for a wider spread would allow participants to travel to meetings and return home the same day. This may result in greater participation. Greater continuity of contact between coordinators and participants would be

likely to improve participation. Ideally, one person should be responsible for contacting participants throughout the duration of the trial. If that is not possible, a detailed handover to the next person is necessary. Allocating time for an annual phone check in would provide more continuity and allow for additional information to be gathered.

8. Appendices

8.1. BIBLIOGRAPHY

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8.2. TELEPHONE INTERVIEW QUESTIONNAIRE

1. In general, are you happy with the progress of your forest garden thus far?
2. Have your objectives been changed, and if so how?
3. Have you done or would you like to do any significant changes at your site?
4. Are you happy with the development of yields? How have they changed?
5. Are you happy with the development of community involvement? How has it changed?
6. Are you happy with the finances?
7. Within the last two years, are there new observations or experiences regarding following? Microclimate, Biodiversity, Soil quality, Maintaining efforts, Struggles/Weakness, Gains/Strengths, Personal skills, Education
8. Within the last two years, have you been able to share your gained experiences or expertise with interested forest gardeners, students or researchers?
9. Have you got any new records you would like to share?
10. What are your needs and wishes for your FG?
11. How do you estimate the future of your FG?

8.3. LIST OF PROJECTS

(crossed out: not interviewed in 2015)

~~1. Black Mountain Development Project, Southfield School, Bradford, Community, 8 acres beside schools~~

2. Bridewell, Barnstaple, Devon, Commercial, orchard 0.5 acres, part of 11 acres

3. Edibles, West Slaithwaite, Huddersfield, Community

4. Residential Suburban Garden, Ilford, Essex, Private, 2 adjacent back gardens

5. Kerswell Forest Garden, Cullompton, Devon, Private, 3 acres

6. Oak Tree Low Carbon Farm, nr. Ipswich, Commercial, 2.5 acres, part of a 12 acre CSA site

7. The Quadrangle, Shoreham, Kent, Community, 2 acres

~~8. Rifleman Cottage, Faversham, Kent, Private, 0.33 acres, part of 6 acre woodland site including a commercial orchard~~

9. Stepney City Farm, Stepney, London, Community, 0.25 acre, 2 acre city farm

~~10. Steward Community Woodland, Moretonhampstead, Devon, Private, 0.33 acre in a 32 acre woodland~~