Facilitating Temperate Forest Garden Development

Creating tools through Participatory Action Research

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8Th August 2016
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1. Abstract

Forest gardening is an agroforestry technique that is not well recognized. Forest gardens are spreading around the temperate world with a diversity of goals, strategies and spatial structures as practitioners implement these needed systems. All the while, a longing for unifying scientific evidence is rising within the stakeholder communities. Tools and frameworks to advance the research of forest garden methods are a basic requirement if this discipline is to gain significant notoriety.

With the aim of strengthening the development of the forest garden discipline, a toolbox booklet was developed through participatory action research. The research had cross-scale/multi-level linkages involving, apart from myself, people from the Food Forest International Research Network, a group of British forest gardeners using their sites as examples, a group of Danish Forest Gardeners and the developing network of Danish Forest gardens.

The research started in United Kingdom, a recognized leading country in the use of temperate forest gardening practices. Whilst there, plenty of information was gathered from researchers and experienced practitioners. Thereafter, important insights were shared with novel practitioners in Denmark and analysed further. The final output is the Forest Garden Archetype booklet. The booklet is an integral part of this master thesis, focusing on explaining the process behind its creation through participatory action research and how these tools may be used to strengthen the forest garden discipline. The participatory action research process proved to be a powerful method both to obtain useful results and to strengthen the grassroot networks.

**Key words:**
Forest gardens, Participatory Action research, Focus Groups, Archetypes, Agroforestry, Permaculture.

**List of Abbreviations:**
Forest Garden Archetypes → FGA
Food Forest International Research Network → FFIRN
British forest gardens → BFG
British forest gardeners → BFGrs
Danish forest gardens → DFG
Danish forest gardeners → DFGrs
Forest Development Type → FGDT
Forest Garden Development Types → FGDT
World Agroforestry Centre → ICRAF
2. Introduction

Forest gardens are perennial polycultures of multipurpose plants. In other words, a forest garden is an edible ecosystem; a consciously designed community of mutually beneficial plants and animals intended for human food production. (Jacke & Toensmeier 2005). Forest gardens are agroforestry systems more commonly known in the tropical regions worldwide as homegardens. Homegardens are important agroecosystems providing economic benefits and food security for local people, as well as favoring on-farm conservation of water, soil and biodiversity (Kumar & Nair, 2004). These systems were the traditional cultivation systems developed and used for centuries by indigenous cultures. They have been studied in the tropics for many years from an anthropological perspective and furthermore, environmental aspects have been focused upon since the 1980’s as the homegardens garner recognition for being foundations of sustainable natural resource management. (Mulyoutamil 2009).

In Europe, a diversity of agroforestry practices were common before the agricultural intensification of the last century (Mosquera & Watté 2012). A recent accumulation of evidence supports that ecosystem services and environmental benefits are inherent in agroforestry systems and practices, both in tropical and temperate regions. Agroforestry systems provide a number of ecosystem services, such as carbon sequestration, biodiversity conservation, riparian zone protection, soil enrichment, and air and water quality improvement (Shibu 2009). It has also been documented that a combination of trees and crops result in a 20 to 40% increase in wood biomass as well as agricultural products from a given area (Teagasc & Curran 2012).

In the 1980’s, long before the evidence began accumulating, Robert Hart understood the importance of the tropical homegarden agroforestry system and replicated one that was adapted to the European temperate climate in his garden in Shropshire (Crawford 2010). Since then, forest gardeners from around the globe, and especially in English speaking countries, have promoted this way of growing food by creating demonstrative sites, holding courses, and publishing books, magazines and web based literature. The forest garden methods are well integrated within the permaculture grassroots movement, a cause that took form in the seventies, promoting the use of biomimicry in its design tools and methodologies for creating sustainable and resilient living (Holmgren 2002). During this time permaculture has only gained relatively modest recognition on the global agenda. To date, the ideas are not yet well embedded in the broader society’s awareness due to the strong grassroots perspective the movement had kept through its expansion (Vargas et al. 2014). A paradigm shift towards integrating agricultural practices by observing the way natural ecosystems work, is imminently necessary for a sustainable future (Jackson 2002).

In the late eighties, when the first wave of permaculturist reached Denmark, there were a few forest gardens established around the country, one example being Permahaven Gule Reer in Roskilde. Yet as the years passed, not many people took the initiative and the permaculture and forest garden ideas remained latent in comparison to the spread that was occurring across the UK and worldwide. In recent years however, the interest in forest gardening in Denmark has been quickly rising and there are more than 88 documented forest garden projects scattered around the country, 63 of which are newly established (figure 1).
With the novelty of this agroforestry concept, it is relevant to ask how practitioners will learn about forest gardening systems in a country with very little experience in the subject. Reading forest gardening literature is a popular method for gaining relevant knowledge for applying forest gardening practices. While being a very valuable method for learning about general practices, literature review lacks contact and dynamic interaction with and adaptation to site-specific problems. In essence, a more practical approach to gain a deeper understanding in the subject is needed. Appropriately, forest garden courses are one of the most common options to address doubts and concerns through direct contact with other practitioners. Promisingly, the amount of related courses held in the Denmark has tripled in the last years (Permakultur Danmark). While being in the actual forest garden space with experienced forest gardeners is undoubtedly one of the best ways to learn the practicalities of the methods, it can however be strongly biased since the information will be presented from the viewpoint and experiences of quite limited number of practitioners. Another limitation is that there is a general shortage of information on successful practices in mature forest garden sites.

Despite the potential forest gardens have in temperate climates and their gaining popularity amongst horticulturalists, farmers, and the public throughout Europe and the world, there is still an enormous lack of research on this specific type of agroforestry system. Notable people such as Peter Harper, one of the heads of the Center for Alternative Technology in England, have discounted the presumption that forest gardening embodies high productivity with low effort, on the grounds of insufficient quantitative data (Harper 2013). While research on other agroforestry systems is extensive and demonstrates the benefits and ecosystem services these systems provide both in tropical and temperate regions (S. Jose 2009) and more practical examples of forest gardening are surfacing, genuine scientific data that demonstrates the advantages of the latter as valuable land use in the temperate regions is limited. This lack of data affects the credibility of the forest garden systems as viable sustainable solution. Furthermore, it prevents the system from evolving and refining the techniques that can be useful, among others reasons, to present detailed knowledge on the best practices possible for guiding inexperienced practitioners to success.

Scientific data is so scarce primarily because the main practicing group is formed by private individuals and small hobby farmers. They focus primarily on living in the forest garden spaces
rather than documenting their experiences. The lack of forest garden research is also determined by the complexity of these systems and therefore, the many variables that can influence the studies, not to mention the long time the systems require to reach maturity. Both aspects encompass the long term establishment of ecological interconnections and the slower growth of trees and other perennial plants. Other primordial reasons for the lack of data might be related to the uniqueness of every forest garden and the difficulties comparing the sites. These wild looking spaces are carefully designed in sympathy with their environment and the needs, visions and values of the creators/users. What is common for most of these spaces, is their conception based on the pattern thinking design principles first defined by Christopher Alexander and his coauthors (1977). This approach was described by the following:

“Each pattern describes a problem which occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over, without ever doing it the same way twice”.

Therefore, impartial to the complexity of forest gardens, the design and management strategy of the system influences its appearance through creating different vegetation and landscape structures, from which it may be possible to identify general patterns (Kaplan 2009). Identifying the patterns present in existing forest garden systems is a good initial step in structuring research related to the different aspects of forest gardening. Additionally, determining these patterns may help define clearer management frameworks for practitioners.

An inspirational example of methodology for categorizing existing forest gardens in a useful framework can be found in the concept of Forest Development Types developed by Anders Busse Nielsen and Jørgen Bo Larsen to integrate close-to-nature forest management in the Danish forest. A forest development type (FDT) is the desired long term vegetation structure for a given site and it is expressed as a desired forest picture at maturity, with particular tree species and their long term management. The forest development types simultaneously depict the possibility to promote timber production, environmental and biological benefits and recreational spaces, as they all are linked to vegetation types (Larsen & Nielsen 2006). Forest gardening and close-to-nature forestry are disciplines which have many things in common. As they both relate to semi-natural systems that imitate natural forest processes to develop management strategies. In regarding the complex nature of the forest-like structures, dynamics, and management arrangements, both require integrative and flexible management frameworks (Nielsen & Larsen 2006). Though one may expect it, forest gardening is not a synonym of gardening in the forest (Jacke & Toensmeier 2005).

The Danish Nature Agency began managing all public forest according to close-to-nature principles in 2005, and the transition was facilitated through a catalog consisting of a total of 19 FDTs and different conversion models (Larsen 2012). This FDT planning toolbox was developed through an action research approach and has proven highly effective in generating discussion platforms for various stakeholders in urban forests to define goals and methods to reach them (Larsen 2012). In a similar manner, a forest garden toolbox can be developed to include a diversity of goals, objectives and strategies that are possible within the forest garden discipline. A research process akin to the one used to develop the FDTs will be adequate in developing tools for the forest garden. Both disciplines require interdependence between science and local knowledge to make them valuable and useful (Larsen 2012). Therefore it is appropriate to use a framework for
awareness to forest gardening practices in temperate climates. In the while, the challenge of promoting a new paradigm discipline to the broader society remains. This is because it is not yet being accepted by the research community, as the field remains fragmented and split into many disciplines (Bjørn & Boulu 2011). However, the challenge of promoting a new paradigm discipline to the broader society remains.

On the other hand, forest gardening is not acknowledged within the recently accepted agroforestry discipline. Right now it is understood as something halfway between agriculture, forestry and gardening, and recognized mainly by the grassroots movements that promote it, as the global permaculture movement. Anyhow the permaculture educational structure and the convergences and gatherings at national and International levels are developing platforms for spreading the knowledge about permaculture methods worldwide, even without the support of major organizations (Vargas 2014). In Denmark the forest gardening stakeholders are, at the moment, predominantly private owners. Interest by the municipal and state institutions remains low. There is no agroforestry policy applied in the country, when it could have been feasible to adopt the measure 222 from the rural development program of the European common agriculture policy (Vargas & Richmond & Sewón 2014). This measure supports first implementation of agroforestry systems. The total area of organically grown fruit and berries in 2004 was 350 ha, which is very little (Lindhard 2004). This places current stakeholder groups into a small sector of society, and all the while, the challenge of promoting a new paradigm discipline to the broader society remains.

In light of these differences, the Participatory Action Research (PAR) approach for the development of a forest garden toolbox will vary from the one used to develop the FDTs. This is due to it not including state or municipal institutions, as the main participants are practitioners and researchers, including myself. When in-person during participatory work, the researcher can be seen as a change agent, someone who is directly and intentionally involved in the field while deliberately and actively engaged in a change process aimed at improvement (Walsham, 2006). With this approach, I designated myself both as practitioner and as main Researcher during the creation of the Forest Garden Booklet. It has been and is in my own interest to bring more awareness to forest garden practices in temperate climates.
3. Aims and Objectives

My personal aim while developing this project has been to learn in depth about forest gardening while helping practitioners with my experience. As I am a forest gardening practitioner involved in several forest garden projects myself, I wanted to do work that involves and directly benefits other practitioners. For this reason, I chose the PAR approach as an appropriate methodology to interact proactively with the subject of study.

Additionally, as I am engaged in the grassroot movement promoting forest gardens from a professional standpoint, it was essential for me to materialize an output that was clearly useful for a broad group of stakeholders. My aim was to enrich the discipline with practical knowledge in a format that could be used by any stakeholder. For this reason the Forest Garden Archetype (FGA) booklet is a tool box that can be used independently from the master thesis. It is crucial that this master thesis is read in accompany with the FGA booklet for full comprehension.

As such, I consider the master thesis mainly as an academic stipulation because it is evident that in order to graduate, I am required to prove my capabilities in producing and analyzing scientific data. Beyond this prerequisite, I hope that this master thesis will be a valuable contribution to the development of forest gardening as a respected discipline.

For the above reasons, the overall research objectives are to strengthen the development of the forest garden discipline through the development of a framework of tools based on the knowledge acquired in existent forest gardens sites. These tools should be developed for education, communication, design, and further research. The research sets a special focus on the Danish forest garden community, yet it will also prove relevant in other temperate regions such as Great Britain, and, to the broader global forest garden movement. From a participatory action research approach, it directly tackles understanding the real needs of the people involved in this community.
4. Materials and methods

This research is based in the Participatory Action Research methodology (PAR). As Action research is characteristically full of choices, the primary rule is to be aware of the choices that are made and their consequences (Reason & Bradbury, 2006). So first of all it is important to understand who has been involved in the research, why, how and what happen throughout the process.

4.1. Participants

To explore these inquiries, different consultation strategies were used in cross-scale/multi-level linkages in order to integrate as many participants as possible through first-, second-, and third-person action research (Marshall & Mead, 2005). (See figure 2). Both vertical and horizontal connections were used to analyse from a broad perspective all the way into a fine detailed analysis of the topic (Armitage 2009). The vertical links connected forest gardeners on their forest garden sites, whilst also connecting them with other forest garden researchers.

The horizontal connections were vast as the research involved different countries.

- At global scale, through the Food Forest International Research Network (FFIRN). The FFIRN was created under the International Permaculture Convergence in UK 2015, during the initial days of this research project. I participated in the formation of this group and remain an active member in the network.
  
  This is considered third-person research, since the inquiry is extended to groups too large to engage in face-to-face communication (Bjørn & Boulus 2011).

- At the North European scale, primarily including the United Kingdom. I participated in a tour visiting Forest Gardens all across the country. In an informal way, the research includes many more forest gardens across Europe that were not officially included in the research but that I have visited. These experiences have therefore broaden my perspective and analysis capabilities, undoubtedly influencing the final output. This was a combination of second-person research as I visited people and discussed themes of shared interest. Later, the communication continued through digital means, transforming into third-person research.

- At the National Danish scale, facilitating a simple overview of the scope of the Danish forest garden movement. The main focus at this scale was through practical fieldwork with three Community Forest Garden Projects on Zealand. As I am a member of the board of the Danish Permaculture Association, I have interacted with many more Danish forest gardens and their owners, than the ones that are strictly considered in the research.
  
  This was second-person action research, bringing each community together to discuss issues of mutual concern related to their forest gardens (Bjørn & Boulus 2011).

- Last but not least, I applied the research methods on myself, being critical with the information that the participants provided, also analysing my own experience as a Forest Gardener through the seven Forest Garden Projects that I have been actively involved in
under this study period and throughout previous years. This is considered first-person action research since it regards the researcher's ability to cultivate a critical approach to her own understanding and research practice, and in general, to her way of being and acting in the world (Heen 2005)

4.2. Ensuring PAR

The framework for this research is an action research framework as defined by Reason & Bradbury (2006). The research brings together action, through the multiple activities, and reflection upon those activities with the pursuit of creating a practical tool to help the forest garden community with its purpose. But to determine if it is truly participatory is more of a challenge, since it can seem that most of the control is done by the main researcher as the interaction with the different groups are majorly for consultation. Moreover, the head researcher is the one analysing and developing the outputs of the research project. To determine whether the project fulfills the basic criterion for classification as participatory action research, one must ask who controls the research in which phase of the project (Cook 2012). Various types of participation have been used throughout the project, were the specific decision-making process was adapted to the groups of participants in each situation. The key information was disclosed and set up to debate for co-creation of the research output. After the material had been processed by the researcher, it was brought back to participants on all levels for further feedback. This ensured that the research went through the required evaluation process (Bergold & Thomas 2012). The influence of the research on the participants involved in the project will be debated in the discussion.
4.3. Research development

The four PAR principles were applied throughout the whole research process several times and at most levels. The principles are observation, reflection, planning and action (Boyle 2012). These principles are used across scales and, the sequence of going through the principles brought me levels of deeper comprehension as I revised the whole set of principles again. Due to this cyclical nature of PAR, the research questions also evolved (Boyle 2012), which may cause unclarity in the research project. To ensure more certainty and clarity around the research project, I will first describe its chronological progression (see figure 3).

<table>
<thead>
<tr>
<th>Observation</th>
<th>Reflection</th>
<th>Planing</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visit 10 English Forest Gardens</td>
<td>Analysis of Interviews + Transects</td>
<td>Development of the booklet draft</td>
<td>FGA draf used with 3 Danish Forest garden communities</td>
</tr>
<tr>
<td></td>
<td>Feedback from Forest gardeners, FFIRN and other experts</td>
<td></td>
<td>FGA draf used with Danish forest garden stakeholders</td>
</tr>
<tr>
<td></td>
<td>Reactions 3 Danish Forest garden communities</td>
<td>Development of FGA booklet</td>
<td>Spread as open source for all to use</td>
</tr>
<tr>
<td></td>
<td>Feedback from the 3 Danish Forest garden communities and from other stakeholders</td>
<td>Development of final FGA Booklet</td>
<td></td>
</tr>
</tbody>
</table>

Figure 3. Graphical representation of linkages between the stakeholders and the basic output through the research process in relation to the PAR principles.

The research began at the International Permaculture Convergence, where the Food Forest International Research Network (FFIRN) was formed. At that point, the few instigators of FFIRN focused on attracting members and sorting out the logistics of the global scale project. Some of the researchers in the network participated actively in the research by providing me with information and counsel on which forest gardens and what aspects of forest gardens
should be studied to suit best all our research objectives. During my internship at the University of Exeter (October and November 2015), I surveyed as many forest gardens as possible within time and mobility constraints. This eventually amounted to 10 forest gardens across the United Kingdom, including southern Scotland, northern and southern Wales, and others scattered throughout England. During the visits, the owners gave me a tour around their forest gardens, I interviewed them, and recorded a number of measurements on the forest gardens. The purpose was to gain knowledge from their direct experiences that could be shared with the Danish forest garden movement. With this information, a booklet draft (Annex 2) was created. This tool was used in practice and analyzed and evaluated by the members of three community-based forest gardens in Denmark. We will call them the Danish Forest Gardeners (DFGr). The tool was developed through workshops with different focus group activities to help with the design of the FGA booklet (Annex 1). Other agents, like the British forest gardeners (BFGs), which were the owners of the surveyed forest gardens, the DFGr, an extended group of forest garden stakeholders in Denmark and the members of FFIRN, provided also a valuable feedback for the development of the FGA booklet (Annex 1). The final FGA booklet (Annex 1) is intended as a communication tool, therefore it is not presented in a standard scientific layout, but a more user friendly style. Most importantly, it sticks to scientific criteria and considers the ethical aspects of the investigation by keeping the anonymity of participants. Below I will explain in further detail the methods used with each stakeholder group.

4.3.1. British mature forest gardens

As mentioned above, the first part of the research consisted of gathering information from ten forest garden sites across the UK. The research integrated sociological and environmental research methods. It is important to mark the distinctions, about which part of the research is based on people, and which is based on spaces. Therefore, I will distinctly mention the British Forest Gardeners (BFGs), the people that do the managing, and the British forest gardens (BFG), the spaces they manage.

Eight of the sites were studied following the method described below. The two last sites have been used as inspiration, as they are two of the most well established forest gardens in UK: Graham Bell forest garden in Scotland and Martin Crawford's forest garden in Devon, yet they were not researched strictly following the research method because the gardeners were not available for the extensive interviews at that time. Nevertheless, I could have had informal talks with them. These two forest gardens were included in some aspects of the research, where the information is available and relevant.

The design of the study was done considering the practicalities of time, budget and moral related notions with the participants, for example considering the limited time availability of many of the forest gardeners' tight work schedules.

4.3.1.1. Selection procedures

The BFG were selected from the UK based Agroforestry Network List (M. Crawford 2010). Some of the research participants that were also researchers themselves, supported by giving recommendations as to which forest garden sites ought to be selected. The selection process was
also based on Tomas Remiarz’s (2014) three Ownership categories of: private, community and commercial forest gardens. I explicitly tried to identify and select sites that fit in the different categories. To examine the sites in this way enabled me to determine whether the objectives of the Forest garden differed across categories. A drawback of the method is the inability to use randomized sampling, thus reducing statistical value. Since no precise numbers are used under any stage of the research, this drawback has been dismissed however.

Due to matters of privacy requirements from the University of Exeter, candidate participants were first contacted by email or phone to enlist them in the project. Thereafter, the forest gardeners were informed about the researcher and her intentions, the goals of the study, and what was expected from them if they consented to participate. Participants agreed to take part in an hour-long, in-person interview followed by a short tour through their forest gardens. Before the interviews took place, a consent form was given to the forest gardeners, containing: background information on the project; the interviewer’s contact details (e-mail address and telephone number); a paragraph calling attention to the fact that conversations would be recorded, and a statement of confidentiality of personal information, warranting anonymity and highlighting that each participant had the right to withdraw from the project at any stage without them risking any harm or disadvantage to themselves. This was reiterated verbally at the beginning of each interview.

4.3.1.2. Interviews

Semi-structured interviews were conducted in order to gain a greater understanding of the visions, values, strategies, design processes, implementation and management methods that influence the creation and establishment of this system. Detailed information can be found in Annex 3. Most interviews were held before exploring the site with the exceptions of three site due to practical reasons. The interviews were developed following the seven stages of interview investigation: thematizing, designing, interviewing, transcribing, analyzing, verifying and reporting (Wheeldon & Ahlberg 2012) This was done in the following manner:

First, the interviewees were informed about the main purpose of the investigation. The concepts to be investigated within the interviews were clarified. The main goals were to conceptualize some of the underlying patterns within forest garden practices in UK and identify key practices and structures for successful forest garden projects.

- The interview questions were based on forest garden literature and social-environmental science literature. They were developed in collaboration with FFIRN, providing me with previous forest garden research interviews and thorough discussion for adapting the new interviews to the needs of my project.
- The interviews were planned from the beginning to have a broad scope, trying to tackle many subjects while allowing the diversity of wills and drivers to emerge. From there I could narrow down the research to the most relevant areas.
- The interview template (Annex 3.1) was tested prior with several individuals with forest garden experience to make sure that it was clear, concise, and understandable to obtain the desired information. Some small tweaks were made before the final interview template was in place.
- The interview process was semi-structured, using the template as a guideline, not restricting the flow of information be adhering vehemently to it. A certain degree of improvisation provided a friendly and relaxed framework that allowed the interviewees to express freely and comfortably their ideas and to connect interpersonally with the interviewer, with the hope of getting the most out of the interview. Questions were therefore often formulated slightly differently than in the template, their order was altered, or the conversations tended to drift towards different areas of interest not touched upon in the template.
- All relevant information was gathered and structured following these steps:
  First, all interviews were recorded for later transcription, ensuring that exact wording was maintained. Afterwards, the most relevant answers were gathered in a single document (Annex 3.2), grouping the different forest gardeners' answers under each question. The most technical answers of the interview, based on design strategies and elements in the forest garden, were gathered in spreadsheets in the form of relevant keywords. (Annex 3.3)

The material was analyzed based on narrative analysis in order to try to understand not just “what the forest garden projects are”, but also to understand “how forest gardeners make sense of what the forest gardens are”. The most used method within narrative analysis was thematic analysis, which focuses on content rather than how that content is presented (Bryman 2001). This was analysed by coding the interviews based on the following criteria:

- Concepts and information that were similar between answers.
- Concepts and information that were characteristic of that site.
- Techniques and practices that were pointed out as being particularly successful or remarkable.
- Concepts that can be used along with theories and nature perception frameworks of interest.

Frameworks used were the theory of place attachment (Altman & Low 1992) that seeks to understand the sense of place and space for the area; the nine basic values of Stephen R. Kellert(1996) that points out participants’ interest in forest gardening; a comprehension of the roles of the forest gardener, as Producer, Manager or Citizen. Additionally, the Environmental Psychological approaches of Arjen Bijls (2009) can be used to see the relationship between their values and their actions. These frameworks have been used to help categorize the forest gardeners, their sites and their methods, whilst rationalizing the connections from vision to practice. For this last and more theoretical part of the work, I have also used performative analysis, which brings emphasis on gestures and the ways of communicating about the forest gardens (Bryman A. 2004). For some specific questions, a visual analysis was created by using the word cloud method (Boyle 2012). As a result of all this information, different categories were developed (See figures 5 and 6 in the results).

The small size of the sample study makes verifications complicated, even more so when some of the final results are general categorizations. There exists, however, different verification strategies that attempt to avoid complications caused by these conditions. The process results were transformed into a booklet draft (Annex 2) that was sent to some expert members of FFIRN and researchers that helped and supported the project, as well as to some of the English forest gardeners so they could voice their opinion and give critical feedback for further analysis. As an external verification source, I will include the analysis of the information gathered in UK with the Danish forest gardeners DFGRs. It started by developing a workshop guide and a powerpoint
presentation (Annex 4.3) based on the booklet draft (Annex 2), and was then put into use during group activities that will be described further down. The FGA booklet (Annex 1) was also sent back to FFIRN, BFGrs and DFGrs for final feedback and verification.

### 4.3.1.3. Analysing forest gardens visual structure

The fieldwork in the forest garden sites had two main objectives. One was aimed at taking pictures of relevant features in the space as graphic references, the other one was aimed at developing a transect diagram for each forest garden visited. This precise representation provides a simplified visual description of an exemplary area within each site selected in some way by the forest gardener. The direction of the transects were decided case-by-case, deduced by identifying the most sensitive orientation for capturing the best possible structural representation of the site.

The transect diagrams were developed in the following way (See figure 4):

After the forest gardener pointed out the area that they deemed most representative of the forest garden site, a 50 meter line (the transect) was placed on the ground and the following information was recorded: the presence of every species of woody vegetation (trees and bushes) at 2 meters to either side of the line; distance from the start to each plant; distance from each plant to either side of the line; height, crown diameter, trunk diameter and any specific branching characteristics.

Pictures were also taken to ensure for accurate graphic representations, the majority of the drawings of the forest gardens visited had been created by Anders Busse Nielsen for a previous project. They were adapted for this new purpose by being reshaped to resemble the real plants and additionally, new drawings were created when needed. The diagrams were a representation of the area that showed, to the best extent possible, the diversity of features found in the space proportional to their abundance. The orientation depended on practical conditions related to the size and structure of the forest garden, slopes in the landscape, and any recommendations from the forest gardeners themselves. After the measurements were taken, the images were developed with Libreoffice impress software using all the data gathered. Two types of images were created, namely profile diagrams and top diagrams, in order to create a clearer perception of the space and location of plants and other structures. The transect diagrams were included in the FGA booklet (Annex 1) that was sent for feedback to all participants.

![Figure 4. Example of a transect diagram measured in one of the forest gardens.](image-url)
4.3.2. Danish young forest gardens

This second part of the fieldwork consisted of holding a series of focus group activities with participants from three Danish forest garden (DFG) projects of recent establishment. The knowledge gathered in England was shared through a presentation and evaluated in a practical way explained in the results section. This was done in order to bring light upon how Danish forest gardeners could benefit from this knowledge, improving their practices, spurring a discussion on how this knowledge would be integrated into the FGA booklet (Annex 1).

A presentation of the FGA (Annex 4.4) and a schedule for the focus group activities (Annex 4.1) were developed following the booklet draft (Annex 2). Each group had a different process and the activities were slightly adapted to the interests, needs and stage of development of the group's forest garden project.

Three main DFG projects in Denmark were selected due to having previous personal contact with the people and their projects. I had participated in them all before, and thus held some previous knowledge and understanding of the projects before engaging in the thesis work. I also participated in data collection by approaching some of the sessions partly as a participant, just as PAR study design allows.

4.3.2.1. The collective projects

The three projects were selected due to their similarities, but also due to their differences. They all are community forest gardens in the Danish countryside, planned and initiated during the last two years, yet they have been guided by different approaches and visions for the respective projects. They will be referred to with the following names capturing the essence of each project:

4.3.2.1.1 - The Cultural collective
Is an open collective with its main focus being on rebuilding an old factory into a cultural and environmental space. A group of approximately ten people, including three residents and several intermittent participants, are developing the Forest garden site. The area is known to be contaminated with heavy metals but there are many uncertainties regarding this condition and its effects, as the pollution is quite unevenly distributed. The only investigation into this has concluded that the heavy metals are well bound in the soil. Because of this, the group of forest gardeners are taking the chance of developing the forest garden site, despite the contamination and are looking into methods that may restore the land.

4.3.2.1.2. - The Spiritual collective
Is a large spiritual community farm. Their main focus is mindfulness work and charity. Some of the members are attuned to local sustainability practices with a permaculture approach. They are developing an ecovillage on the site and are establishing a forest garden in one of their fields that was previously used to grow organic wheat for their bakery.

4.3.2.1.3. - The Production collective
Is a group of nine young and enthusiastic people that came together to create a cooperative to buy an apple press factory farm that includes 6.75 hectares of old apple orchard. They are
transforming it to organic production and are introducing other small side productions as sale of honey. Most of the site is being planned as an agrosilvopastoral system and some areas are being planned specifically to become forest garden areas.

### 4.3.2.2. Focus group activities

With each project a series of focus group activities were held during one or two days, depending on the availability of the DFG group. As mentioned above, the procedure of holding focus group activities was used to extract and analyse relevant information. The different activities will be described below according to their main working fields to allow for an understanding of the methods and aims of each group. The process differed slightly from each group of forest gardeners, yet the main working fields of the focus group activities can be categorized under the following three headings:

#### 4.3.2.2.1. Vision and value analysis

The visioning exercise was done to reflect upon the visions for the project and the values behind it. An initial discussion exposed the definition of the concept of vision in itself (more detail in the results section) and the stage of the current visions of the project. Thereafter, the developed value tool (results section) was presented and each participant reflected and presented their own values for the forest garden by filling in a rudimentary value wheel (Annex 4.5). Finally, the participants shared their visions and values with the group. This last step of the analysis opened up for a discussion on agreements and disagreements, different views that could complement or stand in contrast to each other.

#### 4.3.2.2.2. FGA presentation

(See Annex 4.3 for further detail)

The information gathered from the UK experience was shared with the support of a slideshow presentation (Annex 4.3). Questions and reflections were encouraged openly throughout the whole presentation. All questions and relevant comments were written down as an additional form of data during these sessions. The different sections of the presentation were:
- The classifications. Presenting and discussing the types of forest gardeners and types of forest gardens and common or distinctive patterns identified through the research.
- All classifications were taken up for open questioning and considerations were made as to how the specific forest garden projects and the different forest gardeners fit within these classifications.
- The BFG projects as examples. Showing the value orientations of the BFG projects together with the developed transect diagram that corresponds with each forest garden. Strong emphasis was put on these transect diagrams to fully understand the influence of these in the group reflections.
- Pictures of interesting features in the sites that represented the sites and gave meaning to the categorization and the transect diagrams.
- A word cloud exercise (figure 12) stirred up some thoughts and introduced new ideas.

#### 4.3.2.2.3. - Design of their own forest garden

(See Annex 4 for further detail)

- The Design of their own forest garden site was done partly before presenting the FGA and finalised after presenting the FGA. It was divided in three sections.
- Observations of the site. Through maps of the area, giving a broad perspective on the stage of the project, analysis of what had been done and reflections on how to improve the spaces and their functions. Observations as well by walking through the site and using specific areas for detailed design of the space.
- Creation of plant "wish lists". By looking at plant databases, nursery webshops and/or forest garden literature, plant wish lists were developed by coming to agreements on what plants were interesting for the site. (Annex 4.4). These lists are the basis for looking at and assessing the potential design of concrete areas.
- Design. Using some of the plants of interest, the participants made free hand drawings of how they would like some spots or areas in the forest garden to be. There was space for open discussion and in some groups collective drawing were created and used for visual analysis, thus summing up people's ideas (Annex 4.5).

4.3.2.2.4. The main outputs of the focus group activities
(See annex 4.4 for further detail)
Notes on expectations were written down and gathered after presenting the agenda for the day. The minutes of the meetings were the records of all the discussions had and decisions taken by the group during the sessions. These were analysed by extracting important information, such as participants’ concerns, interests as well as the main issues with the development of their forest gardens. They were analysed together with observational notes.
The observational notes were transcribed by the main researcher throughout the whole process, focusing on responses and remarkable attitudes of the different sections. Additionally, feedback notes were collected from the participants for most sections and activities. Feedback was put together in a chart and the most common comments and attitudes towards the different features were identified. Digital recordings were also made, but due to technical problems they were unfortunately lost. Luckily however, most of the information was gathered through the minutes, the observation notes, and recollections from my own memory. These outputs were analysed using narrative analysis to comprehend how the focus groups activities had been useful for the communities, thereby selecting information and ideas that were clearly relevant for the booklet in making it a useful tool for novel practitioners (Bryman A 2004).

4.3.3. Danish overview survey

Another face-to-face activity took place to gain a broader perspective on the possibilities of the FGA booklet and how it was perceived by the Danish public. The slideshow that was made to be used in the PAR activities was also presented on its own under the event called “Det Fælles Bedste" (The Common Good) where many other people involved with forest garden projects in Denmark gathered and gave feedback on the presentation (Annex 4.3).

Finally a simple survey was sent around some of the relevant web based networks to evaluate on the interest on forest gardens in Denmark and the approach the Danish forest gardeners have to their practices. The networks were the Permaculture Association, “The fælles bedste" participants and several Danish facebook groups with focus on Permaculture, forest gardening, organic gardening, food, health and environment.
5. Results

Most of the work put into developing the FGA booklet (Annex 1) cannot be perceived from the final result. In the following I explain, to the best of my abilities, the thought paths leading to the final FGA booklet (Annex 1). The thinking process from one result to the other is not linear and direct, rather it has been complex and intricate. Thus, arriving to conclusions was done from a mix of inputs and experiences. As can happen in qualitative research, the process of qualitative data analysis is frequently unclear (Bryman and Burgess 1994). It is sometimes difficult to encapsulate all that the researcher actually did and how he or she arrived to the conclusions of the study (Bryman A. 2004). In light of this, I hope that I will succeed in bringing transparency to the thread of thought throughout the qualitative research as I explain the results and conclusions I reached based on the relevant attributes of the FGA booklet (Annex 1). I encourage the reader to start by reading through the FGA booklet (Annex 1) before reading through the results section. In order to familiarize themselves with the process that led to the final content.

5.1. Introduction and general concepts:

An introduction to general concepts related to the forest garden is needed in accompanance with educational tools for new forest gardeners. Yet with this need, two main dilemmas come to the surface:
- Can we agree upon which generic or standard concepts must be well-versed in?
- How many concepts is ideal to focus on and in what level of depth should they be explained?

The answer to the first question comes mainly from working with FFIRN.
As forest gardening is such a new discipline, the concepts of what it implies are still unclear. Promisingly, FFIRN has recently created a discussion forum that enables practitioners and researchers to create forum threads, assemble documents and resources, and organize themselves in order to support food forestry practices and research worldwide. In other words, the aim is to practice adaptive co-management (Armitage 2009) for developing the global forest garden movement on a local and global scale.
Within this platform, one of the main topics at the moment in the discussion threads is to agree on the generic terminology used for our practices. So, concepts such as food forest, forest garden, multilayered perennial polyculture or stacked polycultures are being questioned.
The intention of the group is to find out what they really ought to mean, what the nuances between them imply, and determine the pros and cons of using one or the other.
The group did only come to the conclusion that the most precise term to describe forest gardening is multilayered perennial polyculture but, that is the most academic explanation. As it is not an adequate term if we want the general public to understand and take the concept to heart. Up until now, the terms food forest and forest garden are the most commonly used terms. They are used indistinctively because the meaning of the respective terms are quite close and thus they are often being used interchangeably. Anyhow, we are aware that the following nuances exist, and thus an iteration of this is appropriate here:
Food forest is used to define a system that is a true analogy of a forest ecosystem in regards to architecture and dynamics. It tends to be larger in size than a forest garden. Despite the canopy
being quite close in warm climates, the amount of food products that yield from the system can be quite substantial. In temperate climates, however, food production can be quite reduced in comparison and there a higher focus on timber production is often observed.

Semantically, forest garden is a more appropriate concept because it broadens the definition to not focus only on food. It opens its spectrum to any marketable product, such as fibers, fuel, medicine, ornamental products and so on. In temperate climates, this definition is more appropriate since it implies a system that may have a more open and diverse structure and, like a garden or park, with forest or forest edge elements closer to the type of forest gardens already typically found in this region. They may be as small as a home backyard garden or may extend up to several hectares.

The most appropriate term to use in relation to the type of information shared in the booklet is therefore forest garden.

A related point is to clarify where the forest garden system lies in relation to the more well known agroforestry systems. From the forum conversations and the agroforestry literature it seems that the old concept of homegardens in the tropics can be the equivalent to what parallely have been called forest gardens. Contacting the World Agroforestry Centre (ICRAF) following a stronger concretization of the forest gardening discipline, asking them to include the Forest garden concepts in their classifications, could be a wise idea. General agroforestry terms developed as that discipline grew just as it is happening with the forest garden discipline, and the FFIRN is aware of the lack of a completely satisfactory or universally acceptable definition, yet luckily this does not deter the development of the discipline (P.K. Ramachandran 1993).

Since the FFIRN group is quite new, all these discussions are still taking place in a quite informal way. People in the network share their opinions and ideas about elementary concepts without formal agreements. As the FFIRN evolves, more standardized methods and procedures will be developed to tackle the prevailing developments in a collaborative way.

The second question to consider is: “How many concepts is ideal to focus on and in what level of depth should they be explained in?”

The answer here comes both from the discussions mentioned above, but primarily from the work with the DFGrs, being the FGA booklet’s main target group. Therefore, they are a strong reference while crystallizing what information and knowledge is needed for groups such as themselves. From our conversations we concluded that the FGA booklet is not oriented to absolutely new forest gardeners, but rather to people who already have some basic knowledge in forest gardening. Therefore, the amount of basic information shared in the booklet should be limited since it is expected that the reader would already be well-versed in basic concepts. Otherwise these basic concepts can be better studied by novel gardeners by consulting forest garden literature that is available today. The booklet does not intend to repeat or replace this literature. Rather, it focuses on promoting a different approach for visioning and evaluating forest garden projects. Therefore, it should not repeat concepts mentioned in the forest garden literature, but rather sum up the key concepts that may cause confusion or that have a vital role in creating a foundation for understanding how to utilize the booklet.

Following this heed, a narrower range of concepts may be considered, such as:
“The connection between permaculture and forest gardening”, “The layers of the forest garden”, “Forest mimicry”, “Successional processes” and “Balance between maintenance and efficiency”.

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The resolution was to keep exclusively “the layers of the forest garden” as basic concept since:
- It defines the concept of forest gardening as such (a multilayered perennial polyculture).
- All the other concepts and information will be explained or talked upon along the FGA booklet (Annex 1) in relation to some of the archetypes.
- It is a standard way of explaining the layers using a lateral diagram for representing the concept. Thus, it brings awareness to the importance of spatial distribution in forest gardening and prepares the reader in understanding the transect diagrams with more ease.
- The layers of the forest garden (Annex 1. page 3) can be quite ambiguous and change in the descriptions of the different layers from one author to another. This sometimes makes them challenging to classify accurately. In the booklet, I therefore present the layers in the way that we understand them, adapting the definitions to the needs of the booklet. The actual layers are taken from John Kittsteiner ideas from the Temperate Climate Permaculture webpage and the definitions of what each layer includes is a result of the different groups’ inputs that I have summarized.

In conclusion, the introduction of the FGA Booklet (Annex 1 pages 1-3) gives an overall picture on forest gardening to stimulate interest in the topic. It does that by addressing target groups that may be interested in reading the FGA booklet, what it is going to explain and how the reader navigates their way through it in a straightforward manner.

5.2. Classification of forest gardeners

To classify forest gardeners I began using the classification that the English Permaculture association developed under their project “Ten-year forest garden trial” (Remiarz 2014). It is based on three distinct user-types of forest gardens. Each relates to different sets of goals that the project participants lean towards:
- Private forest gardens → Aims at producing a wide variety of different crops over a long time.
- Community projects → Social yields (e.g. learning) are as important as crop yields.
- Commercial enterprises → Designed around a few major commercial crops.

This classification sets the basis for the research. With the intention of deepening the ideas of relating goals and expectations to types of social and biological yield and therefore appearance and ambience of the spaces.

With this classification in mind, which forest gardens to visit were sought out, aiming at including at least two of each of these user-types of projects. In the end, however, it was only possible to make an in-depth analysis of one forest garden that was commercial in its nature. Other commercial forest gardens were visited and reflected upon during other stages of the project, e.g the Danish production collective mentioned earlier.

Through the interviews, as had been expected, other classifications were developed. The classifications created from the interviews focused on the forest gardeners and looked only at the most basic characteristics of the forest gardens themselves: size and age. The forest gardeners classifications are summed up in figure 5.
The categorization of forest gardeners was analysed considering the following characteristics:

* User type → Described above. (Private, Community and Commercial)
* Drive → Mainly looking at the demography of forest gardeners in relation to age and economic intentions for developing such a project. The classification is described in the FGA booklet (Annex 1). Through the process the term “Idealists” changed to “Passionate” because it was more descriptive and catchy, a characteristic that should not be discredited.
* Place attachment → From people’s connection to the forest garden space, their comments and behaviour towards the forest garden I made a rough scale of how attached they felt to the forest garden place.
* 9 values → Stephan R. Kellert nine values 1996 were used to get an insight on forest gardeners primary concerns and interest when relating with the forest garden. Understanding the forest garden they manage as an expression of nature. The values that were represented were:
  - Utilitarian → Focus on the practical and material benefits that can be obtained from the forest garden.
  - Naturalistic → Interest in wildlife and outdoors activities being in the forest garden.
  - Scientific → Focus on understanding and learning of the natural features, the species and ecological interactions between them.
  - Aesthetic → Primary interest in the artistic features and beauty of the forest garden.
  - Symbolic → Primary use of the forest garden plants and features is for communication and metaphorical expression.
  - Moralistic → Primary focus is an ethical concern for nature and spiritual veneration of nature. Thus creation of such as space for honouring nature.
* Forest Gardeners role → Based on the concepts of J. Hansen-Møller et al 2004 of the three types of present day farmers. Forest gardeners are in of themselves a type of modern farmer. So the three categories were applied to this group in order to understand into which of these categories these forest gardeners will fall:
  - The farm of the farmer - The forest gardener’s focus is on being a producer.
  - The place of living of the peasant - The forest gardener focuses on having a home, being a resident on the site.
  - The showroom of a landscape manager - The forest gardener focuses on modifying the landscape to create a space for nature to thrive.

All roles were present among the group of BFGs and often within each forest gardener. It became clear that the landscape manager perspective was predominant among the forest gardeners surveyed.
Most of these classifications were presented to the DFGrs and they were asked about what they thought about it and how they perceived themselves according to the classifications. The intention was to understand if these classifications were useful for the DFGrs in some way. The participants’ constructive opinions on the ways of organizing people and projects was relevant for developing a useful set of classifications.

The DFGrs were very positive with the classifications they were presented with. They were especially positive about the concept of the productive site, since they saw that the classifications were useful to identify possible partnerships and clients, as well as for developing their own strategy further. Yet for this it would be more useful if the classifications were easier placed in context. Therefore, I developed the forest gardens power structures chart (Annex 1, page 6) starting at the bottom: from the forest gardeners role and the user-type schemes (Figure 5).

The “forest garden knowledge” classification was inspired from a mix of information gathered from the BFG in the booklet draft (Annex 2) and in the section of Common patterns that will be explained later, as well as from the activities with the DFGrs. It was during the explanations about the BFG, where I was explaining about two key concepts separately, that the DFGrs noticed the importance of pointing this out as rudimentary classification. The concepts were: 1) Common mistakes that new forest gardeners tend to make, and 2) How the experienced forest gardeners had most layers of the forest garden well developed, in contrast to most forest gardeners who focus just on the layers they are most skilled at. This last insight was something I could perceive much clearer thanks to a conversation with Tomas Remiarz about the different potentials of the forest garden. Hopefully this information will become clear in his book that will be finished next year. Anyhow, the DFGrs recognized the importance of understanding which level one is at, and remarked that one can aim at mastery, yet this is not a requirement in it becoming a successful project.

Overall it is clear that these classifications may be refined further with more accurate research. As of now, all groups have been developed from the personal experiences of the participants and there is no statistical data gathered to develop the classifications. Yet the classifications can fulfill the function they are meant to for the FGA booklet (Annex 1). They may to create a skeleton framework for further research and elaboration on the subject, bringing awareness about the extensive forest garden network present, and making it possible to get a general idea on how to tackle the different stakeholders.

5.3 Visions and Values

5.3.1 The levels of the Vision:

Forest garden projects are very challenging to visualize due to the complex nature of their structures and dynamics, together with the long time needed before the final result is apparent. Therefore, one of the main objectives of the booklet is to help forest gardeners develop realistic visions for their forest gardens.

To accomplish this, the main questions that were relevant for this development were:

- How are visions created?
- How do forest gardeners make it possible for their visions to get accomplished?
- Are visions static or do they change?
- If they do change, how do visions develop and influence the project?

These questions were answered by going through all levels of the research and with the input of all participants.
Firstly, the interview scheme was planned with an extensive visioning section. This included questions used to understand the initial visioning process, the actual vision situation, the changes that could have occurred, and the reasons behind such changes. At this point of the research, terminology was not settled yet. Moreover, there was a need to define the differences between: the visions, long term goals and values. Based on the forest development goals by Larsen (2012), I separated vision and goals from values. Understanding values as the thinking threads and ideas, that when put together, will define the vision or overall goals. The visions were never dealt with on their own, they were always considered in relation to the values of the project. I will explain this interconnected relation between visions and values more in-depth further down. Now I will focus on understanding the distinction between vision and goals that was not clear.

The first steps were based on previous research facilitated by members of FFIRN. The BFGRs were asked to chose the factors that triggered them to start forest gardens and relate that to the values of the BFGRs (See Figure 6).

**Self reliance →** Wish to produce food and other products for own consumption.

**Lifestyle choice →** Wish to have a personal lifestyle connected with the natural elements through the forest garden.

**Environmental benefits →** Wish to create or enhance ecosystems for local benefits and global protection.

**Financial benefits →** Wish to earn a living from the forest garden products and services.

**Research →** Wish to investigate on aspects of forest gardening, e.g. production rates, soil formation, carbon storage, and so on.

From the information gathered through the interviews, I added two new categories that were mentioned consistently and played a major role in the visions of most forest gardeners.

**Educational purposes →** Wish to bring awareness and knowledge about forest gardening to the broader public.

**Therapeutic benefits →** Wish to strengthen personal health from working or being in the forest garden.

<table>
<thead>
<tr>
<th>Site</th>
<th>Vision</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lifestyle, therapy</td>
<td>Environmental, recreation</td>
</tr>
<tr>
<td>2</td>
<td>Educational, financial</td>
<td>Education and environment</td>
</tr>
<tr>
<td>3</td>
<td>food self reliance</td>
<td>Production, environment</td>
</tr>
<tr>
<td>4</td>
<td>Recreational, Educational</td>
<td>Recreation, educational, environment</td>
</tr>
<tr>
<td>5</td>
<td>Lifestyle, self reliance</td>
<td>Environmental, recreational, educational</td>
</tr>
<tr>
<td>6</td>
<td>Research</td>
<td>Environmental, educational values.</td>
</tr>
<tr>
<td>7</td>
<td>Lifestyle,</td>
<td>Recreation, Educational, environmental</td>
</tr>
<tr>
<td>8</td>
<td>Lifestyle,</td>
<td>Recreational, production, environment</td>
</tr>
</tbody>
</table>

Figure 6. Evaluation of BFGRs Vision and relation to Values
The results showed that most sites had multiple reasons for creating their projects. Lifestyle choice was the most reoccurring one, while economic benefits had just a symbolic emergence. Most significant to note was that for all forest gardeners, the visions had different levels of pace in their development. Most forest gardeners saw their projects as evolving in some level while fixed in other levels. This was expressed through statements like:

"I don't like the idea of imposing a vision on a place but more like allowing the vision to get revealed."

"The vision evolves continuously. The purpose does not change, it is more like an artwork aiming for self sufficiency."

"It is all changing but there are just details, there is one aim. The aim is to demonstrate how you can live from the land."

To facilitate better understanding of how visions change, I described this in the booklet draft (Annex 2) under the vision section and the social patterns sections. The summation of ideas relating to major changes can be seen in figure 7.

I also noticed that satisfaction in projects came many times when there was a feeling that visions had been accomplished. This was true even when these accomplishments were small stepping stones within a much greater goal. The visions related in some way to how the forest garden space was being utilized and developed. That was expressed through statements such as:

"I didn't know who I was making this for. You don't think why you are making the painting. The painting has its own value. It is made because for me it has a significance."

"We felt satisfied early because we had a garden and that was what we wanted, but it was a journey to discover how to use it to its full potential."

Also, forest gardeners suffered from frustration that seem to stem from dissatisfaction in not accomplishing certain aspects of the vision that they expected they would. Furthermore, depending on what level of the vision the disruption was in, it seemed to influence the level of discomfort felt by the forest gardener in regards to the issue. Ultimately, if the forest gardener felt forced to change a behaviour that was disrupting the vision, he or she might develop cognitive dissonance as theorised in the cognitive hierarchy framework (Vaske & Donnelly 1999). Dissatisfaction and frustrations often arose due to practicalities disturbing the long term vision. These concepts were expressed through comments such as:

"The vision is changing partly because of getting real on how much work people are getting in"

"At the start we managed it without any oil inputs and now we realize that we need some help with machinery to maintain the open areas. Things that you can only learn with time."

"In the beginning I did not think that it was going to be so difficult, but when you are doing a very diverse project, is challenging to actually go out to market."
However, these frustrations seemed to be mended by reshaping the vision as best as possible and did not create strong cognitive dissonances in the end. On the other hand, it seemed major frustrations in FGRs arose due to social issues, often because of misunderstandings between participants that had different perceptions of the project vision. These concepts were expressed through comments such as:

"Sometime you can be talking about the same thing, but you are not because the vision is slightly different for the different members"

"The reasons why people don’t get involved? I don't know. I think they should be passionate about it."

All these insights were used for making clear partitions of the vision, with the intention of creating stepping stones to acknowledge success or reshape visions while moving through the project in time.

<table>
<thead>
<tr>
<th>Long term</th>
<th>Medium term</th>
<th>Immediate accomplishment</th>
<th>Change direction into...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selfsufficiency</td>
<td>Get to do courses</td>
<td>Purouse is artwork (Lifestyle)</td>
<td>Change into Education, constant evolution</td>
</tr>
<tr>
<td>Realized later</td>
<td>Open to public (education)</td>
<td>Garden is what we wanted (Lifestyle)</td>
<td>Realized long term educational potential</td>
</tr>
<tr>
<td>Selfsufficiency</td>
<td>Apple press (production)</td>
<td>Be outdoors working together, (Lifestyle)</td>
<td>Stable, but notice that can make a business</td>
</tr>
<tr>
<td>Education</td>
<td>community</td>
<td>fairytale experience (Lifestyle)</td>
<td>Changes with people and miscommunication</td>
</tr>
<tr>
<td>Inspire lifestyle changes</td>
<td>No oil imputs</td>
<td>Example of resilient living from day 1</td>
<td>Realize need for machinery for proper management</td>
</tr>
<tr>
<td>Environmental benefits</td>
<td>Education</td>
<td>Research</td>
<td>Weak group. Research and education weak</td>
</tr>
<tr>
<td>Community space</td>
<td>Education</td>
<td>enjoy gardening (recreation)</td>
<td>Change towards environment by facing reality and learning</td>
</tr>
<tr>
<td>Idilic Lifestyle,</td>
<td>Selfsufficiency</td>
<td>Pleasure of gardening (recreation)</td>
<td>Constant evolution of the space</td>
</tr>
</tbody>
</table>

Figure 7. Analysis for understanding whether visions in projects change and how they do so.

Alas, based on the interview material and on other approaches such as “The cognitive hierarchy framework (Vaske & Donnelly 1999) that scale from broad overall values all the way down to the actual human behaviour, along with concepts of dynamic governance on how to organize a project in Vision, Mission and Aims (J. Buck & S. Villines 2012), I developed different levels of vision. These include: utopic long term visions, medium term goals and immediate accomplishments. These are found in the booklet draft (Annex 2). The levels were presented for discussion with members of the FFIRN and with the DFGRs. Here it is important to point out again that the information was never dealt with on its own, but was always related to values. Some of the relevant insights from the feedback that focused on the vision aspects, included mentioning the importance of celebrating the physical achievements that have been met in order to not lose hope in reaching long term goals. Therefore, it was decided to put more focus on the “medium term aims” as the most concrete way of maintaining momentum in the forest garden project. The levels of the vision amounted to the four levels presented in the FGA booklet (Annex 1 page 7), namely: Utopic vision, long term goals, medium term aims and immediate accomplishments. (Or see figure 8.) They are explained in text and thereafter pointed out when necessary through the descriptions of the archetypes. In the final round of feedback, participants from several levels
pointed out that as the visions were meant to be used in relation to the values, it was meaningful to link the visions in the graphic representation to get a better overview of the relation and differences between the concepts. Thus, I developed the graphics for the vision and linked them to the value wheel (figure 10). This will be explained further.

The concept of the levels of the visions had been developed having in mind the processes in forest garden projects. But it can be applicable to many other long term project.

![Figure 8. Shows a graphical representation of the levels of the vision](image)

5.3.2. The value wheel

The values have been evolving throughout the whole process, but they are fundamentally grounded as the building blocks that define the vision and are represented in a graphical way to facilitate visual comprehension (See figure 10). By showing the key values of the project in a value orientation spatial scale, it illustrates how they differ in importance from each other.

The first representation of the value wheel was inspired by the three main values used in the forest development goals (J. B. Larsen and J. N. Lassen 2015). These are Production, Environmental and Recreational values. This triangular value tool was presented to the BFGrs, but due to the strong multifunctionality of forest gardens, it consistently lacked some values that seemed essential for the BFGrs, namely Educational, Social and Therapeutic values. The most mentioned was educational, so as a test it was added to the value tool transforming it into a square. This caused a loss of the simplicity in being able to place a dot there were the union of values amounted to desired goals. To solve this, I designed it into an oval shape that could extend toward the desired values. This second value tool was used to illustrate the values of the BFG during the focus group activities. Yet before the activities took place, a third tool was developed that included the other mentioned values (social and therapeutic) since I found it important to be aware of the DFGrs opinion on those values. Thus, the tool developed became hexagonal, a geometrical evolution from the initial triangle, and an inspirational and powerful visual frameworks with parallels in form to the permaculture flower (Holmgren 2002) as well as the sustainability analysis tool for
organic farmers. (Tesdorpf 2013) (See figure 9). I developed the tool further, making sure that it would refer to Ecosystem services, and alas, it morphed into having the added benefit of expressing them along with the BFGrs values. The cultural services are divided in different sections (Social, Recreational, Educational and Therapeutic) while the regulating and supporting services are gathered under the environmental values. Provisioning services are included under production values. Even though these ideas were already part of the value tool, the color coding used to express them was added after the focus group activities.

![Figure 9](image)

Figure 9. other similar tools used for inspiration. To the left the Permaculture flower and to the right a sustainability analysis tool.

The focus group activities also provided a substantial amount of information and constructive critique for the value wheel. Some of the most relevant insights were:

- The wording for the values should be specific, understandable and user friendly.
- The difference between Social, Recreational and Therapeutic was not easy to distinguish at first glance. After discussion, it was clear that a clear distinction was possible and highly useful.
- The wording could be more precise to provide better guidance. Therapeutic values were not well embraced. The words “healing” and “well-being” were suggested to make the tool more user friendly.
- There are a significant differences between production values for the sake of business and for the sake of self-sufficiency.
- There are also significant differences between forest garden projects that have educational values because they want to teach and those that simply want to learn.
- Research is the act of trying to understand something by experimenting so it should be a space for learning about the forest garden while working in it.

Only with the first focus group activity did I list the values. I asked the participants themselves to draw the value hexagon, and each participant placed the values in different positions. This opened up for discussing the appropriate placement of the values in the hexagon. The conclusions were that:
- Environmental and production values should be shown opposing each other in order to express the conflict that can take place between them. Regenerational agroforestry practices might enhance both environment and production by making them work in synergy, while conventional conservation may often not allow for production to take place and vice versa with conventional production practices.

- In the same manner, there is a relation between social and educational values since certain group activities can enhance educational values for example (e.g. group work as a learning strategy) while other ones might be detrimental (crowds bringing attention away from the forest garden) and vice versa (educational environment calling for the creation of strong bonded groups) and attribute certain downsides (unsatisfactory educational activities making the social structures unstable).

- A similar interaction was identified between recreational and healing values that may strengthen each other if practiced appropriately (enjoying the space may help heal emotional wounds). Yet they may be detrimental (if recreational activities are frequently associated with drinking, they may be detrimental to the health of the participants).

![Value Wheel](image)

Figure 10. The evolution of the Value Wheel from a triangle to a dodecahedron.

Thanks to this input and much more, I developed the fourth value tool that was defined as the final value wheel. All values were divided in two polarities, transforming from an hexagon to a dodecahedron. Noticing that all the values could be viewed from an inward perspective that considers what one personally wants to receive, or from an outward perspective considering what one wants to give or how one wants to influence other people. The idea thus becomes quite straightforward and eases the understanding of values associated with a project in much more
detail. In relation to the ecosystem services, the provisioning and cultural services relate to the overall groups as before but a distinction can be done for the supporting and regulating services. The supporting services fit within the local environmental values, because creating soil fertility and taking care of the habitats in the area is a personal benefit for the forest gardener, and the regulating services are integrated within the global environmental values since climatic regulation, as well as purification of air and water, are gains that forest gardeners want to bring to the world.

Several BFGrs mentioned in the feedback that the wheel is missing spiritual values, in the essence that nature is something sacred. This has not been included in the value wheel under that title, due to the need for further reflection, both in terms of its place in the visual structure of the wheel and on its implications on archetype patterns. But I understand spiritual values to be included under well-being values, as forest gardens cure both body and soul.

5.3.3. Putting vision and values together

The concept of value has been used in many different ways and in many different contexts, having positive and negative consequences. For example, people in general have an idea of how to relate to values, since the reflection upon one’s values is a core characteristic of being human. Yet due to the individuality of perception and opinion, there is a risk of misinterpretation. The values may not be understood in the level of depth that they are meant to be in that specific context. Preventing this understanding is the main reason behind the need to relate the values to the levels of the vision, in this way making sure that we are tackling each value from the same angle.

A rich diversity of information flourished from the Focus group activities when relating to the levels of vision to the values. Since the values expressed themselves in different ways throughout all the levels of the vision, and since the focus of the project was at times concentrated on certain values, this generated the development of other values at that one level or across different levels. To understand this better, I will now explain it through examples within each of the danish forest garden communities (See figure 11).

<table>
<thead>
<tr>
<th>Utopic vision</th>
<th>Cultural Collective</th>
<th>Production collective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long term goals</td>
<td>Envir.-Local</td>
<td>Self-supply</td>
</tr>
<tr>
<td>Medium term aims</td>
<td>Education-Teach</td>
<td>Educacion-Teach</td>
</tr>
<tr>
<td>Immediate accomplishments</td>
<td>Recreation-Leisure</td>
<td>Social-Community</td>
</tr>
</tbody>
</table>

Figure 11. Keyword analysis of the DFGrs level of vision and values.

5.3.3.1. The Cultural collective

The utopian vision focuses mostly on being part of the creation of an environmentally friendly future by making forest gardening a common practice. The Long term goals for this site focuses on having a healthy forest garden environment void of heavy metals in the soil, as well as nurturing a
strong self-sufficient community that lives off of the produce of the forest garden project. The medium term goals are to educate the group as much as possible in order to accomplish the long term goals. In order for this to happen, a mixed strategy of learning-by-doing combined by hosting external educators that further enlighten the community on important knowledge. Finally, immediate accomplishments are enjoyed in the present moment of the process and boosts the participants’ health and well-being even from the very first steps.

5.3.3.2. The Spiritual collective

The utopian vision in this case is related to the fact that they are a Spiritual collective. They dream and visualize with a high level of awareness of the well-being and health of the global society. They are aware that these things are necessary for global environmental health as well. Therefore, the long term goals are joined together with commercial production to sustain the community directly and economically. The medium term aims focus on involving a stable community in the project that is willing to learn in depth about how to manage the forest garden site. This is important since, at the moment, the forest garden evolves around few knowledgeable educators and designers that come only once in awhile to hold workshops and educational activities to develop the project but are not permanently involved on the site and thus not largely involved in the long term work.

5.3.3.3. The Productive collective

The utopian vision of this group is their concern for the global environmental issues and trying to influence this positively by having long term goals of taking care of their local environment to the best of their abilities with regenerative production practices. Their medium term aims are that they are trying to reach self-sufficiency with as many products as possible. Another important aim is to strengthen the network of similar projects in order to support each other. Their clear immediate accomplishments include the practically educated community they are creating that is deeply embedded in the project.

The process of putting this information together was important for comprehending the use of the levels of vision as well as the values. The tool is intended for the following: 1) For internal comprehension, so as to help projects see clearer what they would like to achieve and evaluate their accomplishments in different depths; 2) For external communication, in order to use it for presenting the project to the public so others interested parties can easily understand the complexity of the multifunctional forest garden projects.

5.4. Forest garden Archetypes

After having an idea of what the reasons were behind creating a forest garden and the values that are involved, the next step is to understand how such a forest garden would actually look like.
What would it be like when fully developed, and what features would it have in order to express the desired values and therefore fulfill the vision? To address this, I present the Forest Garden Archetypes (FGA) together with the value wheel. The final FGA consists of written descriptions of the characteristic patterns, features, structures and dynamics of each archetype together with a short description of a real example that is also shown visually in a transect diagram. There are also pictures of some of the observed and mentioned features. To come to a final selection archetypes, we went through a long process that involved all participants.

As mentioned in the introduction, the initial inspiration for creating this communication tool came from Nielsen and Larsen’s concept of Forest development types (2006). This tool explains, according to different goals forest could have, how they would look when fully matured and what the growing dynamics would be. Even though forest gardens are far from being a true forest, they still have much in common with aspects of a forest that are key for resembling the tools. Like forests, forest gardens are also slow growth systems with dynamic structures, multiple functions and long term goals.

5.4.1. The Booklet draft

The first finalized result was the booklet draft (Annex 2). This text describes the specific intricacies of BFG. The two main parts of this text that influenced the creation of the final FGA, were the descriptions of the common patterns and the Forest Garden Development Types (FGDT). I now discuss them individually.

5.4.1.1. Common patterns

Identifying common patterns was the first step in creating the archetypes. Following C. Alexander pattern thinking (Alexander C. 1977), I used the language used in it to recognize some basic functions in the forest gardens that were consistently being covered by a specific element or technique, and I gathered them in the Common pattern section (Annex 2). The first ones identified were:

- Structural patterns: Winding edges, open spaces, patches of mixed species, focus on certain layers according to expertise, defined boundaries and entrances.
- Establishment similarities since all projects began with a bare field.
- Relevant features: water bodies and compost toilets.
- Social patterns.

The booklet draft (Annex 2) was sent back to the BFGs for feedback. The common patterns section was did not surprise the BFGs, since the C. Alexander ideas of pattern thinking are some of the main strategies for creating forest gardens in the first place. Anyhow, some expressed that it would be interesting and valuable to narrow them down like that using concrete examples. The common patterns were also presented in the focus group activities and the feedback was quite positive since they could be seen as examples or rules of thumb that could be used in many different situations to solve social and spatial problems.
5.4.1.2. Forest Garden Development Types

Forest Garden Development Types (FGDT) was what I used to define the FGA at the beginning of the research, since it had a very similar structure to the Forest Development Types (Larsen 2012), only with the major exception that instead of being ideal models, they were representations of real forest garden sites.

The FGDT included in depth explanations about the BFG that were visited. Tackling for each site in which way the values included at the time (Environmental, Production, Recreational, Educational) were represented in the forest garden. It also included information about the vegetation layers, some remarkable features, major challenges, techniques used in each site, and descriptions of the site structure and dynamics. The information was described in relation to the transect diagram that corresponds to each BFG and to the technical information gathered in the tables “The Elements of the forest garden” and “The Design strategies” (Annex 4.4).

For feedback, BFGs were asked if they could recognize which one was their forest garden, if they agreed with what was communicated, and if they had any remarks or additions. Not all the BFGs answered, but some of the most relevant insights were:

- Several BFGs mentioned that it was a personally enriching approach to think about the values of their forest gardens connecting them to the specific things they do on the site. Yet at the same time, that approach was missing the interconnectedness of everything since it was too much of a simplification.
- Social and therapeutic values were missing in the descriptions.
- Many mentioned that they thought that the amount of species on the site mentioned and the site structure and dynamics of their projects were much broader and complex in reality than was described. It was presented in a more simplified version, yet they could understand that the booklet would become too long if all projects should be explained in the level of detailed they desired.
- They enjoyed the transects with curiosity, since they could in some way recognize the areas knowing their forest gardens so well. However, the lack of depth (further than 4 m line) was making the diagram lose meaning and the logic within the area.

5.4.2. Focus group activities

The focus group activities were taking place simultaneously while receiving the previously mentioned feedback. The focus group activities were part of the evaluation of the FGA. Most of the feedback can be found in the (annex 4.). The most relevant activities that, in a straightforward manner, helped the development of the FGA were the word cloud, pictures, plant wish lists, transect sketches, and the transects diagrams. These are described further:

5.4.2.1. - The world cloud

(See figure 12)

The world cloud was created from the BFGr’s answers to the question.

“What is your favourite place in the forest garden and why?”
The result was a visual tool that show mix of words of different sizes according to the frequency with which they were used. The larger ones were more frequent and they were a mix of forest garden elements, descriptive adjectives and sensations amongst others.

This visual tool was presented to the DFGrs to encourage the thinking process about what things were important for them and in order to start relating the abstract world of values with the concrete physical space in the forest garden. A main insight from this activity was that forest gardeners, both BFGrs and DFGrs, want spaces that nurture the senses, such as sight, smell, taste and the perception of space.

Figure 12. The word cloud from the BFGrs answers to the question:
What is your favourite space in the forest garden and why?

5.4.2.2. - Pictures
(See Annex 4.3)
The pictures had two main objectives: getting a feeling of the overall space distribution, and relating physical structures to functions in the forest garden. In order to fulfill the first objectives, there are panoramic pictures that encompass a broad area of the forest garden and shots that catch the vertical layers of a single area. For the second objective, there are shots of single elements in the forest garden. The most important insights of presenting this visual tool to the DFGrs, was that the panoramic views were not clear or legible enough to understand the space, while the shots for showing the vertical layers were transmitting much clearer the space and time dynamics.
Thus, the panoramic pictures were disqualified in favor of the vertical layer shots in the FGA booklet (Annex 1).
The pictures of single elements were valued higher than most other tools since they give a good idea about what forest gardens are and how they work. So, in the final booklet, there is a predominant focus on these to illustrate the explanations.

5.4.2.3. - Plant wish lists and transect sketches

(See Annex 4.4 and 4.5)

A small representation of the plants listed by the BFG were presented in the transects and through the examples in the focus group activities. They were presented to the DFGrs mainly by way of thinking of ecological functions, structural shapes and layers they are a part of. Yet during the focus groups, many more plants were analysed thanks to the plant tables in the relevant literature. Thereafter, the plants were gathered in the plant lists for each site (Annex 4.4). Many of these plants were the ones used when drawing the transect sketches (see an example in figure 14) for designing the DFG. This process was very enriching. The main insights from these activities came from analysing and thinking freely about what plants we wanted and why. We then noticed the importance of classifying plants not just in height layers and ecological functions, but also in the patterns that plants can have in relation to values, for example, the social and visual functions of plants. So, the plant patterns were included in the FGA and included into the visual tool by pointing out the main patterns through writing keywords inside the value wheel. In this way, the observer relates the specific value with the physical plant patterns immediately (See figure 17).

5.4.2.4. - The transect diagrams

(See Annex 4.3)

The diagrams included the lateral view, the top view, the latin names of the species, the value
square and a northern arrow showing the direction in which the transect were made (See figure 15). The most important insights from observing the BFG transect diagrams were:

- The inefficiency of the northern arrow, since it was not a standard northern arrow, but an arrow pointing a direction within a northern arrow. Thus, it was not easy to understand, even with further explanations.
- The transects are very useful for understanding the foliage density.
- The transects are beautiful, yet because the lateral and floor view are separated, it is hard to imagine the real three-dimensional image and therefore the true structure of the site. It would be better to see the design of the whole site.
- Some DFGs thought that it was too complicated to only have the latin names of the plants. They would have liked to have common names instead.
- There are so many things being considered within each example, that it was challenging to relate the specific values to real examples.

5.4.3. The FGA booklet

To comply with the feedback from the booklet draft (Annex 2) and the presentations (Annex 4.3) as best as possible, I assembled another booklet with a different point of view, this time with what we defined as FGA instead of FGDT. Instead of describing exact examples of how it could be, the focus turned to looking at general patterns that each value encourages in a forest garden. The concept of archetype originates from the Greek word “arkhetypos” that can be separated in arkhe- “first” and typos "model", thus meaning “the original pattern from which copies are made”. This concept have been used in Jungian psychology to analyze human nature (Edinger 1973) but it can also be applied at this desired scale of perception. To achieve this, the values were used to define
the archetypal functions and the space features of the examples to shape them. All the features and dynamics were extracted from their precise examples and explained within the archetype that they represented. The specific transect diagrams and a short description of the site structure and dynamics were included as “Examples” in the FGA booklet (Annex 1), thus these parts could still kept from the original FGDT idea, since they are examples that use pattern to a certain extent, but is not the archetype in itself. The wording FGDT had not been used in the FGA booklet (Annex 1) to avoid misunderstandings and make it more user friendly, yet from here on I will continue to call it FGDT instead of example. So, for selecting which FGDT that should briefly exemplify the possible structure of each archetype, I used the booklet draft (Annex 2) information together with the added feedback of the BFGRs to consider which FGDT showed which value defined the corresponding archetype stronger.

There were some features that clearly showed common characteristics within the forest gardens, but they were challenging to include in the archetypes since they did not have a clear relation to the values of the site. These features are gathered under “Other spatial features” in the FGA booklet (Annex 1).

To summarize the information presented in the FGA booklet (Annex 1), there is a checklist for forest garden developing in the last pages. The first box focuses on giving new forest gardeners an idea on where to find help to proceed with their project. The second box is a summary of keywords of most of the features that were presented in the FGA. This box intends to look at the most relevant insights to consider when planning to use the archetypes in a practical way. The value wheel that follows is also intended to be easy to use in a practical way.

This booklet with the FGA was sent back to all the participants for final feedback. It received very positive critique from all levels of participation, which mainly focused on the relation of the value wheel with the archetypes and with examples within the archetypes. It was pointed out that there are many more features and techniques that could be included in each archetype, yet as an overall introduction, the variety of concrete solutions that are both described in text and photos, is in fact quite a substantial contribution to the communication about forest garden since it can often be hard to make concrete examples beyond the most common general concepts.

5.4.4. The Danish Survey

One more output of this study, is a simple survey that was sent out to relevant networks in order to gain a first-hand impression of the congruity of the forest garden booklet by Danish stakeholders.

This survey was answered by 88 forest gardeners scattered around the country. The stages of development of these forest garden projects vary (see figure 1). The most abundant group (43,2%) of forest gardens are at the beginning phase of establishment, 17% are actively searching for a site to start a forest garden, 17% are half-way through the establishment, 13,6% have a piece of land and the design is still only on paper, and finally, 9,1% of the forest gardens claim to be well established. These results show clearly that most of the Danish forest gardens are in their early stages, and therefore they might benefit from the booklet as an education and design support tool.

In this survey, practitioners were also asked to select the main goals of the project from a list
based on the different archetypes (See figure 16). The results show that 38.6% of the forest gardeners aim at self-sufficiency with food and other products. For this reason the production archetype is the one showing most examples. The next main interest is education (17%), and Commercial production and forest gardening for nature’s sake are both at 9.1%. The last major group was “Other”, an unspecified selection were forest gardeners could write their main goals. This was very useful to notice if there were any other relevant values that were not considered before. 18.2% of the forest gardeners chose this option, yet there was not a single new value that was not present in the value wheel. Actually, all answers were a mix of the other values because the participants were not able to chose one and only main goal for their forest garden project. This reinforced my trust in the value wheel as a valid framework for the Archetypes.

Finally, the participants were also asked if they would be willing to participate in further research, 78 of them responded that they would be positive to collaborate.

Figure 16. The graph shows the overall goal for the Danish forest gardeners

Considering that this survey might not have reached the entire interested public, the figures are not irrelevant. It is possible to see that the forest garden interest is rising fast and the public is starting to try out these methods. This includes private landowners, allotments, ecovillages, communities, garden associations and educational institutions as the forestry school in Nøddebo. Forest gardening related business are also appearing as a nursery specialized in forest garden perennial edible plants. At this time, they sell between 5000 - 10.000 of what they call “Permagrønsager”. All of this points out that Danish public is interested and craving for knowledge on the subject adapted to their region so that they may put it into practice. There appears to be a large latent potential in forest gardens.
6. Discussion

I now analyse how the research might have reached the overall objectives of strengthening the development of the forest garden discipline.

Evaluating the validity of the research at meeting these overall objectives is a complex quest. How one can explore the validity of PAR processes is a topic of concern that Lincoln 2001 addresses, stating that validity at least in its narrower, earlier, and conventional sense, is literally deconstructed. Instead, she clarifies the significance of practical outcome, social relevance and participation as dimensions of quality in non-foundational epistemology (Lincoln, 1995, 2001). Following her advice, I will deliberate on the FGA booklet as a tool to build capacity through communication, education, design and research. I also touch upon how these fields have been enhanced as well through the PAR process with the different groups of participants.

6.1. Reflections on the FGA booklet

(Annex 1)

Through the results, I have briefly mentioned what the aims of the different sections of the booklet have been set as. In this section I reflect on the objectives of the FGA booklet and its tools from a critical point of view, looking at how it can be used in practice, its deficiencies and future developments. The FGA booklet is intended as a diverse tool that can be use to ease communication between forest gardeners and with the broader public, educate in forest garden methods, structure and sharpen the design of forest gardens, and encourage further research. In other words, the aims of the tools are to guide practitioners developing their forest gardens and equip them with a framework to communicate their methods to the inexperienced, while in parallel, invigorating research possibilities on these topics by providing researchers with a framework to operate from. Again, I recommend having the FGA booklet (Annex 1) at hand for better comprehension of this discussion so that you may refer to its content and visuals.

6.1.1. - The FGA booklet as a Communication tool.

Being sure that the information presented reaches the reader and that it is perceived as it is hoped to be transmitted, is in itself a challenging endeavour. People come from different backgrounds and have different ideas about why things are how they are, often influenced by the social groups they have interacted with throughout their lives, among other stimuli. Ensuring adequate understanding of the FGA booklet with such a diversity of target groups as forest garden practitioners, forest garden researchers and the curious inexperienced public, is not an easy task. Having to make some compromises makes me wonder if many of the potential ways to use the tools might pass unnoticed. I believe that it will require further explanation which is presented next,
and that this explanation is presented by someone that understands the tools well while facilitating the process in order for the booklet to reach its full potential and possibly lead to a more developed book in the future.

Overall, the FGA booklet does not need to be read carefully in order to be aptly used as an adequate communication tool since the main communication tools are very visual and the overall concepts are readily comprehended in a way that is sufficient for analysing a forest garden site. The main communication tools are summed up in the last pages, through the value wheel and the box of general archetypes (See figure 19). The idea is to use these in a practical way by marking what the important values for the site in the value wheel are and examining how this fits with the reality of the space through the archetypes chart. Additionally, the front page, along with the wheel and the transect diagrams, can be very useful in getting a general overview of the possibilities of the site and an intuitive feeling of what is desired for the space (Figure 17). The best way to integrate this information is through discussion with the stakeholders of the project. First, a discussion on the different representations of the value wheel can be a way to express the possible visions for the project in order to meet with a common vision. This process can be strengthened with the archetypes features and the transects, through discussion about what these pictures mean for the participants, for instance. Whenever these ideas are clear for the forest gardeners, the common representation of the value wheel is an appropriate framework to communicate with others that want to understand that forest garden project. I believe that since the framework is closer to the internationally accepted ecosystem service framework than to the grassroots permaculture design tools, it might make it easier to understand for environmentalists and others amongst the public that have no relation to permaculture design concepts.

Figure 17. Front page of the FGA Booklet with a sum up of the tools.

If the ideas are extracted from the booklet format, they can by used for multiple purposes. For example, to gather practitioners by interest by using the classifications, the values or the features within each archetype. This is communication at a metalevel and can be put in practice in a web
based style. For instance, by adding the value wheel representations for each forest garden on a shared document of all the forest gardens in a region as “the list of forest garden network of the agroforestry research trust” (agroforestry.uk). This will give the practitioners that go through the list a very quick impression of which projects are alike, or what projects they can collaborate with. There has been a special focus through the development of the booklet in using it to get people together. The relevance of being a part of a network can often pass unnoticed for land based projects such as forest gardens since people focus their energy on developing their own projects and do not think about putting their energy towards connecting with others. Yet, with effort towards working together with similar projects, many things may become easier for them, for example by exchanging information and resources as well as being a part of organizations that promote a change in their favor in the political agendas of the government. In the value wheel tool a whole fraction has been designated specifically for networks to encourage practitioners to consider more consciously the benefits and positive implications that networking can bring to their forest garden projects.

6.1.2. - The FGA booklet as an education tool

The booklet can be used in several ways for educational purposes. It might be most helpful for visual learners since pictures of real examples makes it easier to integrate and understand how complex concepts can be applied to a specific situation. The act of showing such a diversity of features at real sites gives a lot of value to an audience of practitioners that may have little or no experience in making sense of their personal project, and furthermore inspire them with ideas for their own forest gardens. Yet it is important to mention that these features are vastly simplified for the sake of comprehension. The booklet mentions a few reasons why a certain feature is implemented in a certain way without digging too deep as to the reasoning behind the design. The reality is that each feature has been included for a diversity reasons because they are integral parts of a multifunctional system. Multifunctionality is an essential design concept that is not directly addressed in the booklet and therefore its importance might pass unnoticed. An indicator of succeeding to get readers to grasp the idea would be to test if they are able to use the archetypes tool for design by finding how individual features can be included within the different archetypes as they accomplish several functions. From the results of the Danish survey, many participants were unable to select a single aim for their forest garden, and thus I assume that the user of the booklet will understand the concept of multifunctionality.

The first box on the “Checklist for forest garden development” page is key in the educational aspect of the booklet. The intention is to provide the reader with an overview of many of the things he or she can do to learn about forest gardening depending of the level of depth he or she wants to dig into the subject. (See figure 18).

The most important development for the FGA booklet in order for it to be accepted as an adequate education tool in Denmark, is for it to be translated to Danish. This process has already been started by myself and a Danish collaborator.
Furthermore, it will be valuable to find ways to use the tools out in the forest garden space because it is clear for all practitioners that the best way to learn about forest gardening is out on the site together with knowledgeable people that can explain and point out what is going on in the space.

### 6.1.3. - The FGA booklet as a design tool

It is assumed that forest gardeners will know about permaculture design and its tools. I will mention some along the design tool in this section for better understanding. Most of these tools are based in applied ecology science and they focus mainly on systems thinking, landscape ecology and user analysis. They also use visual tools in the form of maps of the whole area. These will be essential for developing successful forest garden projects. Yet these tools had not been included in the booklet. At least not explicitly. The reason for this was that the booklet will expand too much in size and integrating the substantial amount of concepts to cover the topic will drag the attention away from the new approaches. Therefore, it was chosen to keep a simple structure reminding practitioners that this booklet is not an integral design tool, but rather a new set of tools to be added to the permaculture design tool-box.

The main design approach of the FGA booklet (Annex 1) is an expansion of the pattern thinking concepts that relate to form and function. These concepts are presented in an innovative way from a permaculturist point of view and summed up in the “Checklist for developing a forest garden” in the FGA booklet (Annex 1 page 39) (Figure 19). The goal is to look at forest gardens from another angle mainly for the sake of acquiring a different perspective that can be easier to communicate with the non-permaculturist audience. This perspective gets the forest gardener to relate the values of his or her forest garden project and the layout it implies, in connection to the levels of the vision. In this way it is possible to develop a clear timeline for the project development with the
purpose of reflecting on how he or she can make the most out of the forest garden at the different stages of development. A very simplified example may be making use of the educational immediate accomplishments while the community medium term aims and the production long term goals fall into place, always remembering that the utopic vision is mainly environmental.

The FGA booklet also uses a well known image of permaculture, “The layers of the forest garden” in an innovative design method. This is done by presenting the space as the transect diagrams that allows one to visualize the lateral view. In this way the forest gardener can visualize at which height layer a greater plant biomass is represented and in this way relate the distribution of the stacking function according to the purpose of each area. So, for example, it can be considered where the canopy should be open for a medicinal garden or closed for a wilder expression.

Following a similar thought thread, the permaculture concepts of landscape patterns extracted from landscape ecology science, have been used in forest garden design before. Yet previously this was done in a high level of detail that made it complicated for new forest gardeners to understand. Therefore, simplifying it down to these general landscape ecology patterns of patches, hedges and open areas points out the basics in the space (Andel & Aronson 2012). This system of three can be used to create the overall design a forest garden site. For best results it should be combined with P. A. Yeoman’s (1958) Scale of Permanence. This scale identifies typical farm elements ordered according to their degree of permanence: Climate, Land form, Water, Roads, Trees, Structures, Fences and Soil. The main objective of this tool is to prevent water loss and erosion of the land. For a detailed design of patches, hedges and open areas, other ecological design tools should be used, for example considering guilds and nutrient balances to select plant species that support each other.

While the booklet originally was going to focus both in patterns and dynamics of forest gardens, it ended up lacking description of dynamic processes used in forest gardens since, although these methods are considered essential in the forest gardening literature, to my surprise they were rarely applied as expected or not much relevance was given to those topics in the BFGs. Hence, as little information was gained on those topics from the visits, not much focus was set upon them. In the

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Figure 19. Sum up of Archetype concepts for general overview and design.

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<table>
<thead>
<tr>
<th>Archetypes</th>
<th>Environment</th>
<th>Production</th>
<th>Community</th>
<th>Education</th>
<th>Recreation</th>
<th>Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Features</td>
<td>Local</td>
<td>Global</td>
<td>Self-supply</td>
<td>Commercial</td>
<td>Local Community</td>
<td>Extended Network</td>
</tr>
<tr>
<td></td>
<td>Faragers</td>
<td>Activists</td>
<td>Sovereigns</td>
<td>Entrepreneurs</td>
<td>Committed to relationship</td>
<td>Committed to group</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Plant Patterns</th>
<th>Environment</th>
<th>Production</th>
<th>Community</th>
<th>Education</th>
<th>Recreation</th>
<th>Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecosystems</td>
<td>Plants for managing ecosystems</td>
<td>Forest mass for climatic Regulation</td>
<td>Plants for daily Harvest</td>
<td>Plants for Bulky yields</td>
<td>Collective Management Plants</td>
<td>Easy plants to share seeds Or cutting</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>According to interest</td>
<td>According to interest</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Plant Layers</th>
<th>Environment</th>
<th>Production</th>
<th>Community</th>
<th>Education</th>
<th>Recreation</th>
<th>Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layer</td>
<td>Preference to High canopy</td>
<td>Distribution of layers</td>
<td>Small trees</td>
<td>Ground covers</td>
<td>Small trees</td>
<td>Market garden</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Small trees</td>
<td>Bushes</td>
<td>Ground covers</td>
<td>Small trees</td>
<td>Market garden</td>
</tr>
<tr>
<td></td>
<td></td>
<td>According to interest</td>
<td>According to interest</td>
<td>According to interest</td>
<td>Equitably Scattered</td>
<td>Bushes and herbs</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Hedges</th>
<th>Environment</th>
<th>Production</th>
<th>Community</th>
<th>Education</th>
<th>Recreation</th>
<th>Health</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ensangaged for wildlife connectivity</td>
<td>Straight lines for Maximum efficiency</td>
<td>Enclosing for delineating the space</td>
<td>Diverse for Multifunctional examples</td>
<td>Winding lanes for Aesthetics reasons</td>
<td>Enclosing for Bringing security</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Patches</th>
<th>Environment</th>
<th>Production</th>
<th>Community</th>
<th>Education</th>
<th>Recreation</th>
<th>Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Random structure as A natural forest</td>
<td>Regular distribution of Productive species + required nurture plants</td>
<td>Chaotic organization with Clumps, clusters or scattered Distributions of plants</td>
<td>Stereotypical / Experimental simple Guilds constellations</td>
<td>Coherent structure with Clusters or constellations Of species</td>
<td>Geometric Patterns In plant distribution</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Open spaces</th>
<th>Environment</th>
<th>Production</th>
<th>Community</th>
<th>Education</th>
<th>Recreation</th>
<th>Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>To allow for natural regeneration</td>
<td>To take place in Biodiversity meadows</td>
<td>Practical space For transport and manoeuvring</td>
<td>Areas for gathering groups</td>
<td>Areas for Outdoor classrooms</td>
<td>Areas to allow for distant views</td>
<td>Diversity of spaces to be able to choose any preferences</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Construction</th>
<th>Environment</th>
<th>Production</th>
<th>Community</th>
<th>Education</th>
<th>Recreation</th>
<th>Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural homes with Compost toilet</td>
<td>Industrial installations And greenhouses</td>
<td>Pavilions, gathering tables, Outdoor kitchens</td>
<td>Outdoor Classroom, Signs, lab</td>
<td>Tea house, natural playground, Art and sculptures</td>
<td>Siting spaces, Shelters or cabins</td>
<td></td>
</tr>
</tbody>
</table>
booklet they have only been pointed out in the examples that clearly did think about the dynamics of the system. Those examples include the environmental and production sites for the obvious reasons that it is essential for sites with this focus to deal with the dynamics of their systems. I consider it relevant to mention a compiled simplification of the most important dynamics in forest garden practices for a better understanding of the systems:

Successional dynamics: By introducing plants species in the different functional groups that will fulfill the ecological functions that will naturally occur, it is possible to speed up succession (Jacke & Toensmeier 2005). So, for example, first pioneer species are introduced that will be able to survive easily on the barren land. Under their shelter and support, it will be easy for other slower growing plants to establish themselves. As the fruit and nut trees develop, the supporting species can be removed to allow the species of higher interest to thrive.

Self fertilization: The introduction of plants in different functional groups that can provide the nutrients that the system as a whole require can allow for self fertilization (Mollison). Nitrogen fixing plants are a key feature for this. Together with what are called dynamic accumulators, these will be plants that pump nutrients as phosphates and potassium from deeper layers in the soil and make them available to other plants with shallower root systems.

Chop and drop technique: The way nutrients circulate in the system is by cutting the aerial parts of plants and laying them on the ground to decompose and nurture the soil microorganisms and in turn the plants as well. This can be done in all layer levels: Mowing hay that enriches the open areas; Coppicing or pollarding that nurtures trees and bushes and through trimming and pruning the fruit trees. This also allows light into the system, permitting new trees to develop and regenerate the forest garden.

6.1.4. - The FGA booklet as a research tool

Since further research needs to be done in forest gardening for it to gain the recognition that it deserves as a practice in temperate climates, the booklet intends to be a framework to ease the way for this to happen. It can be used by extracting the relevant tools, such as the classifications or the value wheel, and using them to evaluate a vast amount of projects and get significant data on forest gardens’ potential. The FFIRN activities will involve the tools in the booklet at some point, but exactly how has still not been clearly defined. Forest garden research can take many forms but the projects that the FGA booklet might inspire, should preferably be carried out by interdisciplinary teams using PAR approaches.

A very simplistic first approach to this was the simple survey that was sent around the relevant networks to get an impression of the congruity of the forest garden booklet with the Danish stakeholders. This has been a very good start for the upcoming research projects within the Danish forest garden, since a boost in forest garden research in Denmark has already been started by the Danish Permaculture association, inspired by the booklet. The project is based on creating a platform to connect practitioners and researchers in Denmark and is using the FGA booklet as a basic framework to describe possible research projects that could be relevant for the forest garden discipline. Thus, it is and can continue to connect both with the network of forest
garden practitioners and with Danish university institutions through Master and/or PhD. students, as well as the professors that would be willing to supervise them, that are interested in researching these topics.

6.1.5. Future developments

Through the PAR process it was clearly expressed that further developments for the FGA booklet are welcome in the four fields and any other relevant ones that may arise. A clear next step will be to dig deeper into the concept of pattern, identifying other features that should be included in the archetypes, for example, concrete management strategies for forest gardens within each archetype. This may include patterns for: Establishment strategies, successions, plant spacing, seasonal patterns, fertilization, specific guilds, harvesting methods, plant selection, among many others. An example may be this plant selection idea. It arises from the relation between the value wheel and the plant patterns. Digging much deeper into plant patterns and specific species within each pattern will make it easier to develop an analysis tool that, based on the forest gardeners values and motives, can identify which species will suit that specific forest garden project best. If this is combined with the other features it can become a very capable design tool.

It is possible that the value wheel could need some readjustments to include the Spiritual values. Through the whole process I thought that those values could fall into the well-being values. As they are intended as holistic healing in body and soul that comes from the creation of a forest garden. But that perception does not necessarily relate with creating a healing forest garden as it is explained in the Health archetype. It could as well be within the environmental archetype as the spiritual values of forest gardeners relate to the Spirit of Nature. It express through connecting with nature as an entity to listen, learn from and respect. It can be recognize in expressions such as:

“I see myself more as a forager than a gardener”

This perception relates with an indigenous way of understanding nature wWere the human, animals and the plants are all part of the integrity of the forest as an extended ecological family (Salmón 2000). Therefore it might be possible to elaborate one more archetype that tackles how indigenous forest gardens have been and see how that corresponds to the “modern indigenous” forest garden.

Under the topic of research and networks, the value wheel has a simple but very powerful use. It has the capacity to unify the values of the forest garden discipline and identify trends according to region or other classifiable factors. By shaping the value wheel with some of its patterns into an approachable digital format, it would be possible to ask the forest garden community about their visions, values, and patterns, as well as evaluate how they are being met. Thanks to the networks of practitioners as the FFIRN, the Permaculture convergences and other relevant networks, it will be possible to analyse this information from local, regional and even global scales. In previous work I have hypothesized about the values of permaculture as a global movement (Vargas 2013). To consolidate the visions and values worldwide will clearly be a major achievement for strengthening the emerging forest garden discipline.
The further development of the FGA booklet tools are vast and I presume that the potential that lies within its practical use is yet to unfold.

6.2. Reflections on the Research

Descriptions of actual practice are seldom included in action research publications (Marshall & Mead, 2005). This might be due to the complexity of subjective qualitative research processes, such as having to explain the researcher’s unsystematic views of what is significant and important data or the close personal relationships with the people studied or, in this case, the participants in the research (Bryman 2004). Yet I consider of high relevance that researchers reflect upon their own research practices and study the process of action research “in the making” as Latour’s promoted in his book, Science in action (1987). Since PAR is relatively a new discipline and researchers often lack formal training in the practicalities of doing action research (Heen, 2005), describing the actions, but also reflections on the researcher's own assumptions, thoughts, and beliefs, can spark new insights and change our views. The researcher’s transformation and learning process while embracing empirical uncertainties can be used as a catalyst for learning and sharpening our theoretical views on action research (Bjørn & Bolus 2011). Not only on the research process itself, but also for the self-development of the researcher, thereby improving themselves as a researcher by looking within to evolve from a proficient performer to an expert active researcher (Dreyfus & Dreyfus, 1980). Now I will reflect upon the research process itself, specifically why and how it has been meaningful for me and the participants to be part of developing the FGA booklet through such a process.

6.2.1. Reflections on the PAR process

First, it strikes me how the research process has been so evolving and adaptive. It seems as if the research had shaped itself in front of me nearly on its own. I was always backed up by another key participant in my research, whom has barely been mentioned. Jørgen Bo Larsen has supported and guided me throughout the whole process with suggestions that reminded me to stick to the main thread of the project. He helped me stick to and at the same time unfold the thesis statement and overall goals. I began with a very loose framework of ideas and key points about what ought to happen through the research, and the project evolved according to the options and necessities that came along, ultimately into what is a relevant piece of work, in my opinion. When I went to the UK, it was not planned that the booklet was going to be a key part of this master thesis, but rather a supportive tool for the PAR process with the DFG. The depth and complexity of the experience gained in the UK made the focus of the project naturally turn to revolve principally around the booklet. I believe it was a valid decision since it strengthens the connection between the booklet and the focus group activities and, therefore, the participatory action research approach became even more meaningful as the focus groups became an integrated part of developing the tool, not just a test group.
There were many different stakeholders that had to be approached each in quite different ways. So before the communications took place, I struggled with finding a clear "step-by-step method" for how to deal with the participants and how to gather data and relevant information from them. Anyhow, every time I would have a tight planned schedule on how to proceed, yet during the face-to-face communications things evolved. In several cases, I gave up following my own procedures, at least partially. This was because too many factors that were out of my control emerged constantly. Often distractions or participants’ wishes to do something else more meaningful for them emerged. Much to my surprise, whenever the communication was over, I was able to integrate what happened and see the bigger picture behind the conversations, understand in which situations I received the insights I was looking for in the first place, plus many more unexpected inputs that were the truly meaningful in terms of shaping the booklet in relevant ways for the target groups. Since it was essential that there was a space for criticizing the information, feedback through e-mails was key for ensuring the inclusion of the participants in the project. Yet if it had been possible, I would rather have gone through further face-to-face communication to deepen the results from previous communications. The nuances in the expressions and ideas about the topics that came from face-to-face and electronic communications were markedly different, and consistently better in the former.

To comprehend the importance of the PAR in the creation of the booklet I asked myself the following question:
How would it had been if instead of a qualitative PAR process, I had tried to accomplish the overall research objectives of strengthening the development of the forest garden discipline through the development of a framework of tools strictly through a quantitative research process?
I am certain that it would have also had a significant educational value but it might be that the long term implications of developing such a master thesis would have been less relevant for me and for the forest garden community on all its levels. It might have been shaped in a much more focused way into the literature in the topic. On one side, the research might have gained accuracy and precision with the information and data handled, but the contact with practitioners and stakeholders would have been certainly less significant, at least due to time limitations of the research. The connection with reality and the true needs and concerns forest gardeners might not have been taken so much into account. At the same time, it would have meant that the network of strong connections between people with plans for further research and related projects would certainly not have been as defined. This will be discussed in the following sections.

6.2.2. Influences of the PAR in the participants

As we have seen through the results, it is clear that all the participants have played an important role for the development the FGA booklet. In the following section I reflect upon the reverse question: In which ways, by being a part of the research, have I influenced the participants?
6.2.2.1. Personal

Since action research in first-person is gaining recognition recently (Marshall & Mead 2005), I consider myself a participant as well and I will use my ability to express a critical approach to my own understanding and research practice, and in general, to my way of being and acting in the world (Heen 2005). This is because it has been argued that in order for researchers to promote change processes aimed at improving society, they must first be willing ‘to engage in transformation of consciousness and behaviour at personal and interpersonal levels’ (Reason & Bradbury 2006).

For me the process of writing this master thesis goes beyond the academic requirements. It is a deep learning process through which I am trying to gain knowledge and experience for my future as a participatory action researcher, as a forest gardener and as a committed permaculturist, while making a significant effect in the world in the process.

To develop myself professionally through this process I have pondered upon my own on-the-job learning style tendency. This is the use of a particular combination of implicit and explicit learning activities that a person can, and likes to perform (Marjolein. 2005) Two main considerations are: 1) Due to my extroverted personality I have a potential with social or interpersonal learning activities; 2) From what I perceive about my own cognitive capacities, I learn best through images and through practical experiences. These two tendencies are important to bear in mind when evaluating my performance as a participatory action researcher to develop an on-the-job learning strategy for my future work. To develop this strategy I will look at my personal experiences and gains from developing this research:

6.2.2.1.1. - Social research methods

In my opinion the research quality itself is questionable and now I can see many other approaches that would have made this research much more objective. For instance, having a deeper focus on the ways of asking questions, analysing the different narratives separately or cross-checking the findings with triangulation methods, among others. But I doubt that I would have understood which method was the most appropriate by theorising about it. From my experience, I can say that theoretical knowledge for selecting the adequate research methods for a particular situation can only be accurate when backed up by practical experience, since experience helps develop an intuition about how to personally handle that type of situation. In most cases, practice with the adequate reflection on the process is what will make a researcher learn what methods are the most appropriate in each situation (Dreyfus 1980). Furthermore, one must consider that I come from a background in biology with strict quantitative research methods and that I have been shortly exposed to social research during the master thesis. In overall terms, I feel satisfied with my personal learning process for developing a PAR on my own, and I feel much more confident in developing other PAR programs in the near future. For further PAR, I will definitely try to enlist the help of a colleague to develop the project with me since I am aware that, as social learner, I am motivated by working together with others. The most fruitful insights in terms of research ideas have been through conversation with participants or stakeholders that were actively trying to understand and criticize the research project. Furthermore, several scholars suggest that first-person research is best supported when conducted in the company of colleagues who can
both support and challenge the researcher through a collaborative inquiry process (Reason & Bradbury, 2001).

6.2.2.1.2. - Forest garden practitioner versus researcher

Logically by gaining more knowledge on many different ways of doing forest gardening, my quality as a forest garden practitioner has markedly improved. An important strength I have when investigating forest gardens and their people is that I share, not just the practice, but also the same dream. This grants me with empathy and affection to and from other forest gardeners and their work. Therefore, when visiting forest gardeners I easily transition from the formal position of “researcher” to “practitioner” and in many cases even “friend”. This creates a safe space for practitioners to share their dreams and knowledge and collaborate with my dreams in a natural tone.

Of course my performance as a researcher may be questioned from the practitioner's’ point of view, since I, at the beginning of the research, often found myself with the dilemma of not being certain about the true nature of the ideas and decisions that I was taking. As I had already many pre-established pictures on forest gardens and their people this could bring even more subjectivity into the research. To avoid this perception I followed the PAR methodology of observation, reflection, planning and action. I classified my personal experience as a part of the observations, together with all the knowledge gained in UK. In this way, I could allow myself to use my previous knowledge that I was thinking from a reflective point of view and not trying to benefit the type of forest gardens, methods and techniques that I am most in favor of. Yet further doubts on how my own interest influence the things that I notice and integrate into the research came to me while visiting the BFG. So, I decided to call special attention on ways and methods away from my interests. Quickly, I noticed that methods or techniques that were new or markedly different to “how I would have done it” called much more to my attention, precisely because of that surprising first impression. Later through the reflection, planning and action parts of the research, I kept alertness to be able to include in a fair equal balance my favourites forest garden styles, techniques and methods as well as the ones I felt more neutral about but that were still authentic.

6.2.2.1.3. - Why community focus

The type of forest gardening that I am most passionate about are community forest gardens that work both with social and environmental regeneration. For this reason, the three DFG selected were community based projects. I biased the project towards a community focus and considered that this was acceptable because of the inclusive and diverse nature of community forest garden projects. What I mean is, that because in community forest gardens, there is a diversity in opinions and ways to do things as participants in the project. From one side each participant provides information that can be looked at separated. Analysed as an individual forest gardener with its own vision, values and methods, there may still be an ability to describe a broad view on forest gardening, while at the same time the need to communicate, express the personal ideas and visions to create a common project is much more marked than what it would be for a private forest garden. So, from the participatory action researcher point of view, it brings worthiness and
meaning to the research to work with people that are engaged, because they can sense how to be part of the research is beneficial for them straight away. Coming back to myself, I really feel for my environment when working with engaged groups and I will continue to work as a facilitator with this and other projects. When I am within the group I work with a balance between encouraging the participants to contribute with their inputs and bringing inputs myself, but I am aware that my proactive behaviour can also play against my objectives. Because I am so passionate in the way I express myself, this may put off more introverted participants. Therefore another important consideration through my learning strategy is to control my excitement over the topics, and give ample space to the most quiet people in the groups to express their opinions.

6.2.2.2. DFGrs

To participate in the research was a gain for the three groups of DFGrs in several ways. As mentioned before all of them had the need to hold group meetings and activities. But whatever these activities are part of the research or not they might hold similar activities and meetings anyway. So now I will analyse what have been the true gain that this projects have gotten from the focus group activities.

Even that I brought awareness that the main goal for me with holding the space for the focus group activities was the development of the FGA booklet. For all DFGrs the main goals of the focus group activities was related with design and management developments on the forest garden sites and not with the development of the communication tool as such.

On one hand that was a major challenge because we had to bargain and come to compromises on what topics to talk about in our discussions and from what point of view the subjects were being analysed (for the sake of forest gardens in general or for their own project). Anyhow we were all in favor of helping each other. So I wanted to help with the development of their forest gardens and them with the development of the FGA booklet (Annex 1).

On the other hand understanding the focus group activities as a space for developments on their common forest garden project brought authenticity into the discussions and therefore it was possible to see what were the real needs, worries and lacks that new community forest gardens have. Those insights then could be tackled much more effectively in the FGA booklet (Annex 1).

To evaluated on the usefulness of the focus group activities for the DFG participants I consider the previous knowledge they had in the subject, how often did they hold similar activities and how engaged they were with doing something different as helping the development of the FGA booklet (Annex 1).

6.2.2.2.1. Cultural collective

Some of the participants in this collective had some experience with organic gardening but not so much with forest gardening. However, all of them are engaged fast learners with a strong will to develop the project together. During the two years that the project has been running they have held a few planning and designing meetings, some workshops with professional forest gardeners and several working days for partial establishments and maintenance of the forest garden. Many trees are planted, but due to inexperience some have died or being severely damaged by animals. Interestingly, the overall goals of the project had been barely discussed previously; thus, the
methods they learned through the focus group activities for analysing and planning the forest garden were highly valued by the group. They will certainly keep on reflecting on the tools and using them for taking major decisions for the site.

In contrast to what could have been though, because they are experienced with group activities they could easily grasp the procedure followed, value the method and learn to use it on their own. The concepts that they integrated best were: to remember to evaluate on the goals of the project when considering the implementation of new features as a pond or a greenhouse; and a specific group design method that we used called the six thinking hats from Edward de Bono. So in overall terms the focus group activities were meaningful for the project. I will also keep my agreement with them and help designing and implementing a bioremediation strategy for the forest garden.

6.2.2.2. Spiritual collective

The members of this community that are involved in the forest garden project are quite unstable. Because there is an interest from the headmasters of the community that the forest garden gets established, but fluctuating groups of people involved in the process.

There had been several workshops with professional forest gardens to plan the site. But the participants have been mostly temporary members of the community, that have left the project and much of the knowledge has not been transmitted further. So in general there is a lack of knowledge in the forest garden project. In the same way the focus group activities were held primarily for a new group of visitors with interest to learn but very little knowledge or engagement in the actual forest garden site. This group had little to say about the actual project and was mostly interested in learning the basics of forest gardening to apply it elsewhere. Luckily there was as well two stable members of the community that had built up an interest in the forest garden and are now focusing some of their energy on developing the forest garden site. The focus group activities revolved mainly around them and it was quite challenging to handle these two very different groups through the same process trying to satisfy different needs. Both parts showed to be happy and satisfied with the activities. From the day what was clearly most interesting and taken in from both sides was the practical knowledge about forest gardens they were all craving for. Apart from that, it is difficult to estimate how much of the activities they really interiorized, but both groups are for sure satisfied with me as a facilitator because the actual community have requested me to come back and hold some more forest garden activities and the visitor group have hired me to give forest garden workshops for exchange students with their organization.

6.2.2.2.3. Production collective

The members of this group are the most stable and dedicated to their project of the three collectives. They had invested their savings in this apple orchard farm that now is their home and they dedicate most of their time to run the farm. Some of them have formal educations that are related to farming or sustainability and others are independent students in topics related with their roles on the farm. But the farm is such a big project were things as pruning trees, harvesting fruit or taking care of animals must happen and can not wait till they have gain all the theoretical knowledge about them. So much of the planning and tasks in the farm follow the strategy of
learning by doing. With only one season they have accomplished many things but there is still a lot of basic planning that is not in place because they rarely give themselves the time to come together and discuss about overall issues as what type of forest gardens they want to implement and where should they be. The do have a computer based community planning tool called Loomio where they communicate and decide upon some things in the farm. But not the major decisions about the landscape they manage and transform. Therefore they clearly express their gratefulness for having someone external to the project to get them together and guide them through some collective decision processes in this topic. Many relevant insight came up through a deep evaluation on the season they had in the farm. As well as some important decisions about defining the different levels of the vision for the whole farm project and well grounded reasoning processes for the placement of 3 forest garden areas within their land. For each forest garden, visions, values and overall character for with main features based on the examples of the FGA were agreed. After one of the forest garden areas was design more in depth through drawings and transects. Not much of the design had been implemented yet. But there is plans to start with some parts in the near future. The communication tools were taken in as on more of the methods they will use for further design. They also found a big use in the classifications for analysing possible partnerships, communication and commercial strategy. So some participants want to help with further planning and researching to find some numeric data on the classifications.

6.2.2.3 BFGRs

The second person PAR process with the UK forest gardeners was much weaker as they mainly give me inputs that I used with other people. But later the third person process through email was quite profound with some of the participants. There was clearly different levels of engagement and interest. From some participants I did not receive further feedback. They were all extremely helpful and engaged when I met them in person, so I assume that the lack of answers has been mainly due to them not focusing their energy in computer communication and being busy with their forest gardens or other projects. However others are very eager to contribute with the research process and contributed substantially through the different feedback rounds. They clearly express that they are very passionate about forest gardens benefits to the world and that they are satisfied knowing that their small contribution is helping people and research in this topic.

A related gain that all forest gardener were very interested in receiving was promotion of their forest gardens. Both as mentioned for the sake of world environmental benefits but as well for their personal benefits as bringing more people to their courses and activities, or having volunteer help, among others. But in the booklet there is no explicit reference to any of the projects. This is because for Exeter University Ethics Committee to approve my work in UK, all participants privacy must be ensured by keeping their information anonymous. This was a clear conflict because actually most participants wanted their data to be public. So I agreed with them to besides the booklet write some informal articles about their projects. These will be published in the following months in the Permakultur Danmark webpage.

6.2.2.4. FFIRN

The support of the FFIRN on the project had been very substantial. As both practitioners and
researchers with many years of experience have pointed out relevant information thought out the whole process. I want to believe that my role in the group had influence the development of the network for the better. And the tools that I developed with their help can be satisfactorily used in further research. Several researches have pointed out the big potential of the value wheel and the crucial importance of highlighting it in such a way as through the archetypes spatial structure, values and goals. Anyhow I think that the most significant contribution from my side will start now after the thesis, by using the frameworks we had developed in the booklet to carry out further research. One of the most important contributions the research had brought is as I mentioned earlier, the connections between people that now can help and support each other. This is both through the creation of the FFIRN itself that connects forest gardeners in a global scale. But that would have happened anyway even that this research did not take place. Anyhow this research is creating connections to that network and many others at different scales and in different ways. For example by mentioning some of the relevant networks in “the ways of learning” chart in the booklet. As the booklet is going to be distributed through the networks and be available in the “Permakultur Danmark” webpage it might encourage many more to join the FFIRN and participate in further research. Actually as mentioned in previously, first contact had been taken with 88 forest gardeners in Denmark that are willing to participate in further research. This is already of big relance for FFIRN as I have been the contact with all the Danish forest garden network.

7. Conclusions and perspectives

In the late 1970s, following the report Limits of Growth, and with an increasing concern by governments and bankers about the looming scarcity of resources, that Bill Mollison Stated:

“But no one had any long-term ideas and it was obvious to me what had to be done...”
“...That was to build an army of permaculture field workers to go out and teach the ideas of sustainable food production.”

(Pacific edge)

Now forty years later, the army of practitioners is starting to gather and the slow growth grassroots movement is consolidating. Forest gardening, as a metaphorical “combat strategy” is expanding and rising in importance both in a Danish context and on a global scale.

Hand-in-hand with the re-ruralization of the countryside, forest gardening, in the same way as other agroforestry techniques, can provide provisioning, supportive, regulative and cultural ecosystem services for society. Yet there is a need for further studies in the way forest gardening methods can reach these places, and a deeper comprehension on stakeholder groups and their motives is also needed. It is crucial that the individuals, businesses and organizations that want to take responsibility for creating these systems should be greatly valued and supported, especially when they want to research deeper into the subjects.

PAR is an appropriate approach for investigating these systems since it may enhance the practice,
help identifying areas for improvement whilst gathering data on the practice, and even encourage stakeholders to take further action towards their goals. The FGA booklet (Annex 1) is intended to bring forest garden stakeholders closer to their goals. It is a good start from which further developments must follow. Participants from the research and other forest garden stakeholders will start to use the FGA booklet in practical ways in their forest gardens. It is expected that the FGA booklet (Annex 1) is inspiring people to take further steps on research activities and develop the tools deeper to support practitioners. It is still to be observed what would be the long-term impacts of the FGA booklet (Annex 1) in the forest garden grassroots movement. But I personally will continue facilitating the process to strengthen the development of the forest garden discipline. with the ambition that forest gardening practices reach in the coming years to be recognised by the broader public and acknowledged by educational institutions as Universities and in this way facilitate its path into the political agenda of states around the world. Aiming specifically at countries like Denmark due to it is showing itself as a sustainability model. For achieving this recognition, further PAR processes are encouraged and will be used. Since this method has the ability to be a progressive change instigator of such an inclusive nature that allows for many possible positive side effects.
8. Acknowledgments

I want to express my deep gratitude to all the people that had helped making this master thesis possible:
Professor Jørgen Bo Larsen and Professor Jørgen primdahl for your good advices, Cathrine Dolleris, Aiah Noak and all the permaculturist and forest gardeners in Scandinavia that have taken the time to answered the surveys, Dr Emma Pilgrim and the University of Exeter, Tomas Remiarz, Chris Warburton Brown, all the members of FFIRN, all participants to the IPCUK. Daniel Hudson, Martin Crawford, Graham Bell, Sagara, Janta Wheelhouse, Merav Wheelhouse, Bruce Slark, Frank Bowman, Jane Morris, Ben, Rachel, Dave Richard, Marko Anyfandakis, Richard Perkins, Nanna Katrine Hansen, Malte Roed, Signe Pedersen, Jim Wright, Lucie Hrabalová, Tom, Eli, Sofia Kazmi Kølig, Karl Aarenstrup Jensen, Laura Camina Despacito, all the other members of Makværket, Dada Krsnasevananda, Cease Sekkle, Garba and the crossing borders students, Sandra Villumsen, Jens Hansen, Vilde, Martin Zaar, Martha Mali, Simon, Mikkel Dalhoff, Nynne Louise Bach, the members of Byhaven 2200, Jaime Pérez Molina, Larisa Damian, Bjarne Gantzel Pedersen, Victoria Grape, Kat Gordon, Marina Sal, Ella Moltke and Martin Moltke Wozniak.
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- “List of forest garden network of the agroforestry research trust” find at: https://www.agroforestry.co.uk/about_us/network/