

Reflection paper on supporting sustainable food forest development – especially its economic dimension.

*Gut Ding will Weile haben
(Steady Drop Hollows the Stone)*

Stefanie Albrecht, PhD

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Nachhaltige Lösungen, Lebensmittelwälder, Agroforstwirtschaft, wirtschaftliche Nachhaltigkeit

Lebensmittelwälder sind mehrschichtige agroforstwirtschaftliche Systeme, in denen Früchte, Nüsse, Kräuter und andere Lebensmittel angebaut werden. Oft bieten sie auch Dienstleistungen in den Bereichen Bildung und Erholung an. In diesem Beitrag werden die Herausforderungen und Erfolge bei der Förderung der wirtschaftlichen Entwicklung von vier Lebensmittelwäldern in den USA und Deutschland beleuchtet. Insbesondere wird die inter- und transdisziplinäre Zusammenarbeit im Zusammenhang mit wichtigen Erfolgsfaktoren wie der Beschaffung von Startkapital, der Planung eines landwirtschaftlichen Betriebs und dem Erwerb von unternehmerischem Fachwissen beleuchtet. Außerdem wird das unternehmerische Ökosystem, die unterstützende Struktur um diese Standorte herum, wie Dachverbände für den Landzugang und Vermittler für die Konfliktlösung, untersucht. Für Lebensmittelwälder ist eine professionellere, wirtschaftliche Unterstützung erforderlich, damit sie ihr volles Potenzial entfalten können, z. B. durch eine betriebswirtschaftliche Ausbildung von Lebensmittelanbauern und langfristige Landzugangsstrukturen. Für transdisziplinäre Forscher können Geduld und Ausdauer mit einer starken Ausrichtung (Vision) helfen, diese langfristigen Lösungen erfolgreich umzusetzen.

Food forests are multi-strata agroforestry systems that grow fruits, nuts, herbs and other foods. They often also offer services in education and recreation. This paper reflects on the challenges and successes to support the economic development of four food forests in the U.S. and Germany. In particular, it looks at the inter- and transdisciplinary collaborations in the context of major success factors such as acquiring start-up funds, planning a farming business and gaining entrepreneurial expertise. It also looks at the entrepreneurial ecosystem, the supporting structure around these sites, such as umbrella organisations for land access and mediating agents for conflict resolution. For food forests, more professional, economic support is needed to develop their full potential, e.g. through business training of food foresters and long-term land access structures. For transdisciplinary researchers, patience and persistence with a strong direction (vision) may help to implement these long-term solutions successfully. enhanced by personal experience reports from France and Germany.

Imagine

By 2050, a network of ~200 food forests exists covering at least 200ha of agricultural land in your region. They provide biodiversity islands and wind-breaking corridors; healthy food products from fruits, herbs and nuts for planetary health diets; educational and recreational events for guests and volunteers as well as diverse incomes from products and services for forest farmers. Each food forest enterprise is part of a decentralised hub focused on management of the system and marketing of its products. In each hub, around 12 food forests share specialty tools for harvesting, jointly use processing facilities and marketing channels, exchanges knowledge about specialty crops and provides consultancy services to bring more agroforestry, edible landscapes and the use of their products into the region. A national network that connects and represents all regional food forest hubs is well connected with an entrepreneurial ecosystem around them that support their uptake and establishment. Amongst others, it fosters the professional education of food forest farmers to run a poly-cultural farm as well as a multi-functional business. It further supports forest farmers in gaining long-term access to land as well as start-up funds for infrastructure and staff. This network is also the political advocate for food forestry and upholds the legal acknowledgement for biodiverse, dense agroforestry as a high priority land use type.

~ My food forest vision, 2024 ~

www.food-forests.org/en/intro/about-us/

My food forest vision develops and changes over time but its general direction is like a light at the end of a tunnel that guides me forward and brings me back on the path that can be windy and full of distractions or detours. This reflection paper is based on a longer journey towards collaboratively developing food forests as sustainable food system solutions. As this is a broad and deep undertaking, involving changes of practices, principles and policies of diverse actors and systems, in this paper, I will share a broad as well as personal perspective on this journey and then dive deeper into this particular chapter in which my work was supported with a stipend by the *Andrea von Braun Foundation*. The stipend facilitated inter- and transdisciplinary knowledge integration to extract robust lessons for successful setup and early management of food forests. It utilized insights and partnerships from my PhD project on numerous food forests from around the world (Albrecht & Wiek 2021, 2022; Wiek & Albrecht 2022).

Food forest are multi-strata, biodiverse agroforestry systems including trees, shrubs and herbs. Besides multiple ecological benefits, they produce food and are usually also a social place of education and recreation. However, they commonly struggle economically due to their high setup costs, late yields and ROI as well as insecure land lease. Food forests are a strong sustainability solution that one plants for the next generation as tree growth is slow but brings multiple benefits (e.g., nuts, herbs, shade). To support the development of



Figure 1: Planting the FFC food forest in 2022
(Source: <http://food-forests.org/en/four-cases/food-forest-cooperative-ffc/>)

their economic sustainability, during my Andrea von Braun stipend (July 2021 – September 2022), I supported four sites and started a handbook with support material.

Situated at the end of my PhD, at this time, I was working on scientific publications as well as practice-oriented workshops and meetings to implement food forests as sustainability solutions. Furthermore, we had started planting two food forests: one in Phoenix, Arizona, USA and one in Lüneburg, Northern Germany, after around four years of research, networking, trust building and other preparations. These planting activities at both sites were a major milestone reached after many failures and phases of stagnation in both locations. The two sites are part of this study, as well as two further sites that are located within their region to provide a more stratified case study sample. Due to physical distance, time constraints and my stronger involvement in the multi-year development of the two co-initiated sites from my PhD, there was a bias towards them with more activities and data. Only a few meetings could take place on the other sites, and were focused on key issues for them (recruiting suitable entrepreneurs and land access).

Overall, multiple stakeholders and disciplines were involved in this action-oriented study ranging from landscape and housing architects, ecologists and engineers, sustainability scientists and NGO activists, hobby and professional gardeners as well as finance, IT and real-estate experts – from students to practitioners and professors (see table 1).

Table 1: Stakeholder groups involved with their disciplinary background and level of economic expertise

Stakeholder groups	Disciplinary background	Economic expertise
Food foresters	Four sites with teams of 1-5 core members with diverse professional backgrounds in architecture, education, catering, IT as well as financial and real estate services.	Well-developed economic expertise within their profession, partly running their own business, however, little to no business know-how within perennial farming and marketing of food products. Although one case is a well-established permaculture farm (<i>Hof an den Teichen</i>) and the other has two co-owners with financing and management backgrounds (<i>Food Forest Cooperative</i>).
Researchers	Researchers from landscape architecture, engineering, sustainability science and ecology.	A few researchers involved had a business economics background studying sustainable economics including the study of success factors for transformation processes towards sustainable food enterprises, however, in practice they were experts in teaching and not running a business.
Students	Undergraduate ecology students with a comprehensive transdisciplinary education as well as landscape architecture and graduate sustainability solutions students.	Very few Ecology students with a minor in Economics (<5 of 92 students) across five semesters of teaching at <i>Leuphana University</i> . At <i>Arizona State University</i> , none of the five undergrad Landscape Architecture students had economic expertise but two of the graduates on Sustainability Solution-shad studied cooperative businesses with one graduate founding <i>Thrive Consultancy</i> to educate on and initiate coops.
NGOs	Educational and incubator farming organizations	Two NGOs thrive for the incubation of farming business, running a farmers' market (<i>Spaces of Opportunity</i>) or CSA (<i>Waldgarten Rehfelde</i>) but success is mostly based on grants gained with relatively low entrepreneurial expertise.

Summarizing, only one case (*Hof an den Teichen*) had experience in running a farm business, including diversified incomes from food, education and recreation. However, it is also cross-financed by a foundation that was created by a successful real-estate manager. Professional backgrounds were overall strong in the field of education across diverse disciplines as most practice partners were NGOs or researchers. Most economic expertise was at a junior or theoretical level or within another profession other than farming.

After reflections on my disciplinary background, in particular, this reflection paper will focus on the inter- and transdisciplinary challenges and success cases working with these stakeholders on the economic sustainability of food forests.

My multi-disciplinary background, and how it all started

Tracing my personal ‘food forest journey’ all the way back, it probably started with the many barefoot summers in the garden of my childhood as a base of my connection to nature. Born in the GDR shortly before the wall came down, fear of unemployment was probably the darkest cloud over my teenage years. After school, I gained a Bachelor in *Business Economics* in 2009 and moved from Germany to Australia. Sustainability was not on my radar. I started to work in the field of marketing and advertisement in Sydney, happy to find a well-paying job as a fresh graduate. This vibrating city was fascinating. I enjoyed living by the sea in the subtropics and a circle of musical friends downtown. However, I soon started to question my work. I promoted big brands and business models where profit was everything. I was unhappy about how I invested my time and energy. A nice mix of self-worth, frustration and yoga-based reflections fueled my wish for change. I came across the Permaculture movement which was started by Bill Mollison in Tasmania, an island south of Melbourne. When applying all the principles of permaculture (a design technique for permanent living and working systems), one product can be a food forest. Over the years, I visited many permaculture locations and studied this method. I saw many happy home owners and hobby farmers, but missed professional food production systems that provided an enduring monetary income. How could this be done?

Returning to Germany, I dove deeper into agriculture, sustainability, commons and collaborations with an interdisciplinary Master in *Integrated Natural Resource Management* at the agricultural department of *Humboldt University of Berlin*. I started to work at *Ecologic Institute* where I contributed to research projects on EU soil policy, agricultural pollution, transformation processes, and art for sustainability. My overall training provided me with a broad interdisciplinary perspective, understanding needs and challenges of diverse actors and speaking diverse disciplinary ‘languages’, mostly in the food system.

Transdisciplinary transformation research on sustainable food forests

After gaining broad knowledge around sustainability and its many challenges, I wanted to gain deeper knowledge of solutions and how to implement them. In 2017, I returned to my childhood dream of an abundant food forest, understanding it now as a potentially sustainable solution and systematically analyzed different sites and tested its implementation. I started a PhD within the graduate school *Processes of Sustainability Transformation* at *Leuphana University Lüneburg* in Germany to study food forests as drivers of the global transformation towards sustainable food systems. Being part of a PhD group with different perspectives, mine was the transdisciplinary perspective.

Transdisciplinary research brings together multiple single disciplines or interdisciplinary researchers as well as diverse practitioners such as politicians, NGOs or businesses (Lang et al. 2012). This action-oriented research aims at exploring and testing sustainability solutions with practice partners. As my PhD supervisor and collaborator Prof. Dr. Arnim Wiek was based at *Arizona State University*, I spent a total of 9 months in Phoenix, Arizona. During the 4.5 years of this PhD (October 2017- April 2022), we went through several phases from project initiation to exploring transfer and scaling (see figure 2) of sustainable food forests. This resulted, amongst others, in two co-developed sites, three scientific articles, several transdisciplinary seminars with undergraduate students and a website on food forests (www.waldgartenwelten.de).

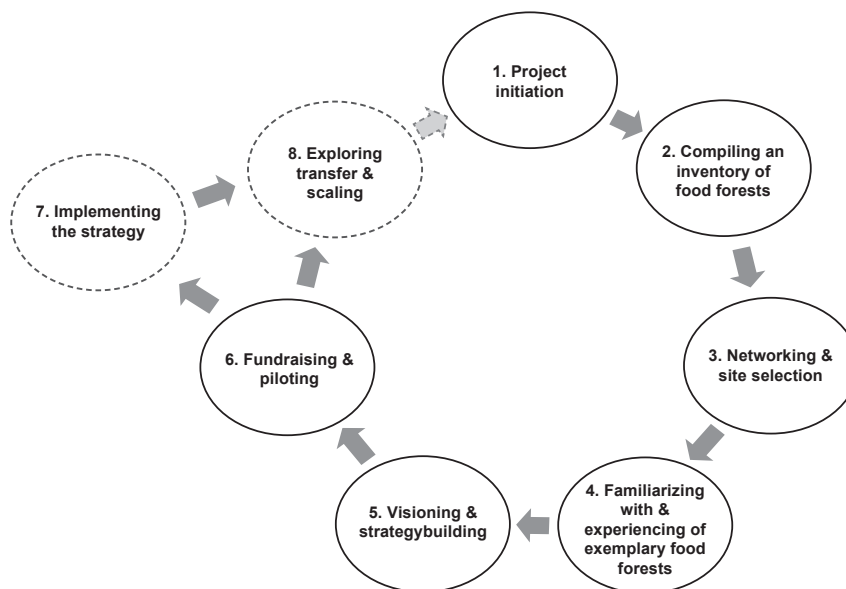


Figure 2: Phases of our transdisciplinary research to develop sustainable food forests (Wiek & Albrecht 2022)

When we initiated my PhD project, we firstly compiled an inventory of food forests in industrial food systems mostly in Europe and North America (Albrecht & Wiek 2021a) (Phase 1-2). We provided evidence, that most sites were strong on the ecological and socio-cultural dimension but underperformed economically. We further looked at the success factors during the implementation process of diverse food forests (Albrecht & Wiek 2021b). Based on these analyses including good practice examples, we aimed at initiating two sustainable food forests sites with a strong social, ecological and economic dimension.

Due to the international perspective of my PhD and in the context of my graduate school, one location for the start-up was Phoenix, Arizona, U.S. and the other was in Lüneburg, Germany. In both locations, we went from networking to selecting a site and partnership, to familiarizing local stakeholders with sustainable food forests, building a vision and strategy to fundraising and piloting a sustainable food forest site with them (Phase 3-6). In Lüneburg, we had to restart the cycle after ending an unsuccessful partnership and started a new collaboration with the permaculture farm *Hof an den Teichen* at another site. During the final phases 7 & 8 of my PhD project, I gained a stipend from the *Andrea von Braun Foundation* to publish and further develop the many practical results of our research and support four cases in their economic development.

The four case studies

During that final phase of my PhD, I investigated, compared, and supported the ongoing implementation processes of the two co-initiated food forests as well as two additional sites in their region, one in Germany and the other in Arizona (USA). All projects were at different stages of implementation, which offered a good base for a stratified comparison and helped to draw insights relevant to numerous practitioners and researchers within the field of agroforestry.

The **Food Forest Cooperative (FFC)** was initiated in collaboration with the *Sustainable Food Economy Lab* from *Arizona State University* and *Spaces of Opportunity*, a consortium of NGOs with an urban incubator farm and community garden on around 10ha in Phoenix, Arizona. In March 2021, the *Food Forest Cooperative* formed with a team of five entrepreneurs to manage the 0,5 ha site, about 2 years after we had initiated the collaboration as part of my PhD. The team brings together a diverse skill set including experience in perennial gardening, plant-based ancestral food catering, community work, education, finance and grant acquisition as well as welding. The group is guided by a strong vision of regenerating the health of the land and people. Growing organic plants in a hot desert environment is a challenge, hence, their focus is on drought tolerant and indigenous growing methods. Planting started in February 2022 and continues. They grow, amongst others, prickly pear cacti, chiltepin chilis, moringa as well as mesquite, mulberry, apricot and fig trees. From early on, they experimented with products from food products for the catering business of one

of the coop members to health care products for a hospital. On a new 1,5ha site, the plan to collaborate with nature paths to further develop their health care product line.

The 0,3 ha **Arcosanti food forest** - or rather forest garden due to its small size¹ - is located at *Arcosanti*, an experimental town and community focused on ecological architecture. It is based one hour north of Phoenix, Arizona, where a higher altitude creates a milder desert environment. Planting started in 2021 and continues as donations come in. Its development is supported from forestry researchers at *Northern Arizona University* and neighbors with a background in running a nursery. During my visit in February 2022, it was managed more like a community food forest than a business. Their vision entails to have one food forester generating an income from managing the site. Hence, as part of my support, we co-developed a job description for a food forest farmer and created awareness amongst the community on its economic potential.

Waldgarten Hof an den Teichen was sparked through a series of transdisciplinary project seminars called Food Forest Lab that my colleague Dr. Agnes Friedel and me established at *Leuphana University Lüneburg* in Northern Germany about 1 hour south of Hamburg. After failing with one site in collaboration with the local *Green Space Administration* in 2019, we successfully started a 1ha site with the permaculture farm *Hof an den Teichen*. This permaculture farm produces vegetable and herbs with more than 200 annual and perennial plant varieties as well as animal products from sheep, pigs and chicken as well as bees. The farm attracts many visitors, especially families that visit the animals, and sells produce at their farm shop and café. In the background, the foundation *Campus Stiftung für nachhaltige und zukunftsfähige Entwicklung* sponsors the farm and food forest development through its successful real estate business. For several university semesters, around 100 students, mostly with an ecology background, contributed through our project seminars and Bachelor theses to the site development from site analysis and planning to crowdfunding and planting. In May 2022, about half of the food forest with more than 6.000 plants was planted within a few hours with the help of 120 volunteering engineers on a company excursion that were guided by a group of our students. Further key developments were supported by a large group of landscaping architecture professionals spending their yearly week of team building and volunteering work at the site. The food forest produces products for their café and farm shop, and tours are educating on the concept.

¹ *Albrecht & Wiek (2021b)* defined a minimum size of 0,5ha for a food forest. In this handbook we continue to call the *Arcosanti* site a "food forest" as it is the name given by its founders. Furthermore, the site is connected to an orchard and a natural forest, so it contributes to providing for forest-like ecosystem services.

Finally, **Waldgarten Rehfelde** is a 3ha food forest located around 30km east of Berlin. The land was bought in 2020, planting started in 2021 and continues to this day. The group experiments with diverse planting techniques (syntropic, polyculture and permaculture farming inspired by, amongst others, Miyawaki, Shepard, Crawford and Remiarz). Funding is gained through diverse public sources (e.g. ELER, UBA, Deutsche Postcode Lotterie). Ramos Strzygowski, a former IT expert, is the initiator and driving force of the project and co-develops the site slowly but steadily with a core group of around five volunteers. Their umbrella association *Sarsarale e.V.* acquired the 2,7ha site. Due to their special case of acquiring agricultural land as an association with a business plan (which is not common in Germany), we wanted to share how this was done, overcoming restrictive regulations to land access.

Table 2: Overview of the four food forests (2021)

Food Forest	Food Forest Coop Phoenix (FFC Phx)	Arcosanti Food Forest	Waldgarten Hof an den Teichen	Waldgarten Rehfelde
Site context	Urban farming & education	Ecological architecture community	Permaculture farming & recreation	Community learning farm project
Location	Phoenix, AZ, USA	Arcosanti, AZ, USA	Lüneburg, NI, Germany	Rehfelde, BB, Germany
Climate zone	Hot semi-arid	Mild semi-arid	Oceanic	Continental
Team	5 entrepreneurs	3 full-time agriculture volunteers	2 part-time entrepreneurs	Pro-bono 1 full-time and 3 part-time entrepreneurs; up to ~30 experimental garden volunteers
Partners	<i>Spaces of Opportunity</i> NGO consortium	<i>Acro Agrotecture</i> (educational NGO) <i>Arcosanti Foundation</i>	Foundation <i>Campus Stiftung für nachhaltige und zukunftsfähige Entwicklung & agricultural business Hof an den Teichen</i>	<i>Association Sarsarale e.V.</i>
	<i>Arizona State University</i>	<i>Northern Arizona University</i>	<i>Leuphana University Lüneburg</i>	-
Site size	0,5 ha	0,3 ha	1 ha	2,7 ha
Ownership	Public-Private Partnership	Private (Foundation)	Private (Foundation)	Private (Association)
Planning started in	2019	2019	2021	2020

The four sites are between 0,3 – 2,7 ha in size, located in diverse geographic locations within Northern Germany and central Arizona. While most sites are run by a foundation or association, one site is run by a cooperative business. Most sites collaborate with a university (except *Waldgarten Rehfelde*). All started planning around 2020 and are still in the process of implementing the site with no or little income from the food forest. The FFC shows the most advanced planting with 80% of the land being planted with the tree and shrub layer.

Challenges and success factors working inter- and transdisciplinary on food forest economics

Success factors along the implementation process of sustainable food forests were a main part of our research findings (Albrecht & Wiek 2021a & b, Wiek & Albrecht 2022) and are also guiding the publication of a handbook (www.food-forests.org). Another guiding concept is that of entrepreneurial ecosystems with are supportive environments for innovative sustainability solutions.

The following section of this paper gives a definition and overview of these concepts followed by a reflection on the challenges and gains from working with different scientific disciplines and practice partners as well as coping strategies and transformative factors for the main challenges.

Success factors to implement sustainable food forests

On the ground, various success factors are relevant to setting up a sustainable food forest ranging from accessing land with a long-term security to building a knowledgeable team to professional site and business planning for a polycultural and multifunctional farm (Albrecht & Wiek 2021b). The following reflections focus on three mayor success factors with high economic relevance: acquiring start-up funds, planning a farming business and gaining entrepreneurial expertise.

Expertise in acquiring donations vs. business development

With a long development cycle of fruit and nut trees, it is difficult to economically manage the first few years in a food forests. Perennial tree and shrub grow slowly compared to conventional annual crops like grains or vegetables. In a food forest, marketable yields usually start after around 5 years and become substantial, meaning financially self-sustaining, after 10-15 years once the tree layer is at high productivity. After this, one can expect high yields for many decades. While our market economy is structured along annual competition, a food forest is more of an investment for the next generation. Hence, the common strategy for the first years of development is about raising start-up funds. Rather than becoming experts in running a self-sustaining business, food foresters become experts in fundraising. Here lies one of the biggest challenges, where short-term, real-world needs

meet long-term visions. The main difference in disciplinary background seems to be that while food foresters are well accustomed to fundraising and have little financial resources (e.g. NGOs, associations) at their disposal, they may take longer in food forest setup since fundraising often means additional tasks (e.g. administration and reporting, sending out messages and goodies to crowd-donators). For example, at FFC, a major follow-up grant provided three of the five food foresters with a substantial income to develop another site. This supported their general continuation of work around the topic of food forestry but with a focus on another site, and a new focus on grant writing and reporting activities. Similarly, *Waldgarten Rehfelde* is busy with grant administration and reporting. However, insufficient fundraising activities can bring the whole project to a complete halt due to lack of funds (e.g. *Arcosanti*).

Only at *Waldgarten Hof an den Teichen*, where a foundation has supported land access and start-up costs for the food forest implementation, the focus is fully on business development. In my observation, this scenario of financially well-equipped people and businesses starting a food forest, is becoming more common amongst food forests and other complex agroforestry systems with a stronger economic and food production-oriented focus. There are younger generations that have inherited money (e.g. Gut und Bösel, Wilmas Gärten) or others that have earned well through other businesses around real-estate, IT or tourism (e.g. Thomasburg, Holawi, Michelberger Farm), and now invest into food forests.

Love for diversity of foods vs. marketable product focus

Once diving into the topic of food forest, everyone, independent of discipline, becomes fascinated with all the potential foods that could be grown. A food forest can be like a manifestation of globalization for perennial gardeners with a huge diversity. Plants are often from other geographic areas with a similar climate. However, often little is known about the taste of these foods or their productivity in the region, soil and microclimate. Hence, ‘trial and error’ experimentation is very common. With limited land resources and much uncertainty, focus on marketable plant selection is rare and often the (future) yield quantities of current food forests are too low to bring them to markets. Furthermore, future markets are uncertain – will people really like and buy (more) paw paws or aronias in Germany or finger lime and mulberry in Arizona in 10-20 years? Within a changing climate, don’t we need a diversity of crops, isn’t that the core task of food forests to experiment with future climate-safe foods? These are arguments by some practitioners that do not want to focus on selecting a few productive crops. At our four cases, only FFC has to some extent focused on cash crops (plant donations and thefts of plants changed the original site plan). Selecting some cash crops can be a key strategy for running a sustainable food forest that can provide for the livelihood of forest farmers. This cash crop strategy is often applied by businesses in the tropics where these systems are more common but also more recently and widely by Dutch food foresters (Stichting Voedselbosbouw 2022). Around the cash crops there can still be a

diversity of other crops and supporting plants, e.g. for fertilizing or pollinating plants. Also, when selecting key cash crops, factors like ease of harvest and involving chefs that would process these products could play a bigger role to work more efficiently and effectively. In my experience, creativity and a good chef can turn most foods into a well-marketable product (as practiced by food foresters and chefs at e.g., Michelberger Farm). Creativity around processing special food products could even be a 'boundary object' (Bergmann 2010) or tool to bring together diverse disciplines to develop one language and create sustainable solutions (e.g. marketable food products from food forests). For our four cases, most have still much space on the ground cover layer and could focus there on some key cash crops like herbs or (perennial) vegetables. At FFC, the group installed a large green house to produce herbs for covering the ground in 2025.

Game-changing perspective: Marketing sustainable food products

Many forest farmers I came across in my wider research (and also from the four case studies), showed a dislike of our growth-based economy which, for some, resulted in a neglect or rejection of economic considerations or practices like account keeping or business planning. Many had a socio-cultural background with prior or current jobs in physiotherapy, artistry or education. Their food forests were designed by intuition or by permaculture principles aiming at self-sufficiency and recreation in their home gardens. Their small food-forest-related income came mostly from education rather than food production. During setup, they were thinking about the site design, imagining where the plants grow and its aesthetics – not what product, price, distribution channel and way of promotion they will use. A change of perspective from the beginning of the development could benefit food forestry, in seeing marketing as a tool to sustain the food forest enterprise and its farmer – and by that making it an attractive, stable job opportunity. At this stage, three of the four case studies experiment with different marketing channels besides education. E.g. FFC created health-care boxes with infused oils and ointments for a clinic and *Hof an den Teichen* started farm-to-table dinners with food forests products. *Waldgarten Rehfelde* is selling some annual vegetables on occasional market days.

Other factors: Pace and care

Further factors certainly play an important role. For example, pace and timing of different disciplines and type of actors is a factor to observe. At the permaculture farm *Hof an den Teichen* - a running business - our partners were at times too fast to keep up with when, as researchers, we were also collaborating with students and needed time for evidence-based research. Instead of following a plan that we had developed based on multiple site factors, our practice partners dug out a deep lake for the site opposite to where we had planned because the machine to dig it was around, and we were not. On the other end of the spectrum was a prior collaboration with the *Green Space Administration of the City of Lüneburg*

that we ended, as their pace was too slow in decision making and would have required larger political advocacy.

Generally, successful partnerships were characterized by mostly warm-hearted, caring professional relationships across disciplines and practices. Collaborators cared for nature and the people around them.

Sustainable Entrepreneurial Ecosystem

Entrepreneurial ecosystems are the supporting structures and institutions around innovative enterprises that support their sustainable development e.g. by providing consultation, infrastructure, funding or advocacy (Wiek & Albrecht 2022). Within a well-developed ecosystem, such solutions can thrive with more ease. The following reflections evolve around key issues such as ownership and decision-making issues with land providing umbrella institutions, mediating services for change agents and professional resources provided by universities as catalysts for change.

Supportive leadership of disciplinary umbrella organizations

Generally, all food forests from this sample collaborated closely with organizations where sustainability was as a major goal, although with different prioritization regarding other activities or varying definitions of sustainability. Two of the four food forests, *FFC Phoenix* and *Arcosanti*, were located on land leased or owned by another foundation or NGO (consortium) and both cases struggled with lack of prioritization of their needs, although to a different extent. At *Arcosanti*, the leadership has prioritized *architectural* activities for a long time. Their founder, Paolo Soleri, started a way of design thinking in 1969 called *arcology* that was meant to bring together architecture and ecology mostly through low-impact living in cities that encompasses futuristic building. However, from a sustainability perspective, their design was related more to special aesthetics and dreams of human life among the stars. Ecology or holistic sustainability thinking was subordinate (reflected by, amongst others, using concrete as the main building material and lack of food production despite 10 ha (25 acres) of productive land, underused greenhouses, etc.).

Despite having hosted permaculture founder Bill Mollison for a workshop in the 90s and creating extensive agricultural plans for their land, they did not put them into practice. To date, their main income is based on handcrafts, especially their widely known bells. Regarding the food forest, managers struggle with receiving *Arcosanti* resources, e.g., volunteer accommodations, especially those closer to the food forest, are mostly reserved for architecture students. Even when I came for a one-week stay, negotiating my accommodation as a food forest advisor was a (small) issue.

Mediating agents to navigate conflicts in multi-disciplinary settings

The *Food Forest Cooperative* also struggles with a lack of leadership support from an umbrella organization, although with less intensity. The FFC food forest is located on urban farm land leased by *Spaces of Opportunity*, a consortium of NGOs with various activities. At the base, the activities and professional backgrounds of major actors involved are more educational and fundraising is a major income source. The leadership aims at sustainable development and organic farming, and works through multi-disciplinary activities from running an incubator farm to train urban farmers as well as a weekly market, to involving the neighborhood in community gardening and workshop. However, there is a stronger focus on annual farming and perennial fruit trees along their road are little cared for. The food forest is of low priority and younger compared to the many other projects. Furthermore, several personal conflicts with the leadership challenge the food forest team, hence, communication is difficult and a mediating agent, as we researchers are used to being, is lacking. The group has limited its connection with *Spaces of Opportunity* to only the most necessary appointments and is working in parallel on another site.

Universities as catalysts for change

Food forest *Rehfelde* is also accessing land through an umbrella association that bought the land, however, with no prior activities on this land and more as a legal financing and administrating vehicle. *Rehfelde* is more challenged by its peri-urban location with lack of nearby supporting institutions and volunteers. It is the only site from this sample that has not been directly collaborating with a university. In all other cases, the university context provided for expertise, volunteers, spaces to meet, professional site and action plans, facilitation of events to develop the site, navigation of multi-disciplinary encounters, etc. These resources supported professional and relatively fast initial development of the FFC, *Hof an den Teichen*, and partly, *Acrosanti* food forest. In particular the first two sites were supported through my four-year PhD, where I served as a direct link to the network and resources of two universities and took on a lot of project management, grant acquisition and facilitation activities. In Lüneburg, I worked with a co-teacher and many students of a transdisciplinary project seminar on developing the *Hof an den Teichen* site. As ecology students, they were very motivated to support food forest development and as teachers we had a direct, regular connection with them, which helped feedback processes and overcome challenges.

The active time of a semester lasted only around 3 months and student projects were sometimes difficult to navigate (high workload, unrealistic goals, diversity of topics and methods, group dynamics, unavailable practice partner, etc.). However, as we continued the seminar regularly (over 5 years) and used a Wiki for students to document their work, the next cohort could build on this. In Phoenix, I connected to students via professors of engineering and landscape architecture at *Arizona State University*. Student groups worked

on maps to search for available sites in Phoenix and Tempe in the early project stages, and later, a Bachelor thesis created a site plan and a project group an irrigation plan for the food forest. Here, communication was partly more difficult or quality of the outcome weaker, especially due to highly technical language as well as lack of regular, closer supervision of professors. Still, these collaborations sparked good thought processes and provided for evidence-based, systematic approaches and valuable communication tools (plans) for later acquisition of funds. Collaborations that could have been nice add-ons for communication of food forests like the connection with a virtual reality professor brought ideas about using gamification for mainstream understanding and education about food forestry but were less essential, and hence, not pursued any further.

Patiently and persistently moving forward

Writing the handbook to support food forest development has taken me a long time and is still ongoing. Practical support like project management at the two sites we co-initiated and planting at the same time was often more urgent. Furthermore, I was busy writing a framework paper to finish my PhD thesis embedding our three scientific articles in the larger context of transformation research. Reflecting on this with my mentor, Arnim Wiek, professor in the field of food system transformation with multiple publications including a handbook for sustainability students, helped me gain a wider perspective. His handbook on implementing sustainability solutions took him several years to write. He self-published the first version in 2015 for his students. His process included trying out these materials in classes and shaping them. So far this is lacking for this handbook draft with a larger sample.

I am beginning to realize that this might be a lifelong journey, just as a food forest is a lifelong project. Plus, my target group are (livelong) students of earth and (self-)care in a complex, industrial society. Developing conceptual tools that are applicable in different contexts needs a process of diving deep and zooming out to gain a broad and deep perspective.

I feel my current job - teaching and developing curricula as well as doing project work on agroforestry at *Eberswalde University for Sustainable Development* - is a good incubator space for the journey ahead. A milestone for the next few years is to develop a 2-3 year course in agroforestry set-up and management here to provide for professional education in polycultural farming. Further milestones along the success factors we identified include, amongst others, forming pilot regions for food forest hubs and creating networks of supporting entrepreneurial ecosystems to ease access to land and start-up funds. And shape my practical experience in managing a food forest near my home and processing nourishing, marketable products from it.

Self-care - The base of care for sustainability

On the journey so far, overall, my inter- and transdisciplinary education and work experience helped me to develop associative thinking and supported a multi-faceted approach to change – one of the nine essentials for action-oriented transformation research (Fazey et al., 2018). It includes an openness to learn from different perspectives, seeing connections and forming a common language. It also involved reflective practices like writing a research diary and meditating regularly.

These practices also helped me to accept detours. For example, shortly after starting my teaching position in Eberswalde after my PhD, I was asked to implement a new Bachelor degree on Sustainable Food and Agri-Culture (in German: Ernährungs- und Agrarkultur nachhaltig gestalten (ErnA)). It distracted me from the seemingly direct path to support agroforestry uptake but provided me with a larger perspective on the food system, practical know-how on curriculum development and its implementation, a broad connection to diverse university staff and its surroundings as well as deeper insights into food processing (which is part of the degree). Now, with detours, it is important to know, when to let go, to not get too far off track or exploit personal resilience. After one year of building the structures for this new course and implementing it, which was very demanding in the context of a public university with little funds and overworked staff, I had to arrange for another person to take over what was becoming mostly organizational work. Even though it only seemed six months away that the two professorships for this course would start, these were six months too long. My other projects and work had been neglected and I was in too many roles to manage well. Regular yoga, meditation and other self-care practices – and their lack in overly busy times – showed me when to stop.

To start something, is relatively easy for me. To develop it can be challenging. But marking a good ending is a mastery. The same goes for this learning and reflection paper for finishing the process of my stipend. It has taken some time.

Patiently and persistently moving forward

My biggest teacher along the way has been patience. Trees teach you to be patient as they grow in their own pace. The abundance of precious nut trees comes in after a decade of care. Agroforestry is a teacher in patience with its many trees but also with the need to observe and adapt the system in managing and overcoming the first difficult start-up years patiently and persistently.

In our fast-moving convenience-oriented society, patience becomes an even higher virtue. In Portuguese, the word for patience is *paciência* – the science of peace as one of my teachers says. It's a lifelong study, to not force but let things develop. To be in a flow state as the

Wu Wei philosophy teaches. As we see more wars in this world where people fight other people or nature, peace is more necessary than ever. On the outside, as well as on the inside. This inner peace, in particular, creates the space for opportunities to come in and for our awareness to realize and pursue the suitable ones. Patience can also co-exist well with economic principles of efficiency and effectiveness.

In transformation research, we observe different paths of societal change. Steady and slow as well as radical change - the later coming through a 'window of opportunity' that, often through a crisis, opens the chance for a radical shift. Having prepared for this shift, potentially with a handbook and pilots as a suitable solution can be a good strategy to use this window and open new pathways. I hope to experience this in my lifetime for agroforestry and food forests, in particular.

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Curriculum Vitae



Stefanie Albrecht

Profile:

Stefanie Albrecht was born and raised in Rostock, Germany, on the Baltic Sea. She studied *Business Economics* with a focus on *Media & Digital Communication* (B.A. in 2009) at the *University of Applied Science* in Ravensburg, South Germany. After working in the field of online marketing in Sydney, Australia, she returned to Germany and studied *Integrated Natural Resource Management* (M. Sc. in 2016) at *Humboldt University of Berlin*, fascinated in particular by the work of Elinor Ostrom and the commons. She worked for three years in a think tank, advising political institutions on sustainability topics in particular about soil policies, agriculture, sustainability transformation and urban development. In 2022, she finished her PhD on “Developing Sustainable Food Forests – Key Features, Success Factors & Transdisciplinary Partnerships” within the graduate school “Processes of Sustainability Transformation” at *Leuphana University Lüneburg*, Germany. Since 2022, she is teaching about sustainable food systems as well as transformation and transdisciplinary research at the *University for Sustainable Development Eberswalde* where she is also doing project work on agroforestry and economics. As a freelancer, is monitoring the socio-economic development of the project “Urban Food Forests” (Urbane Waldgärten) by the *University of Potsdam*. As a scientist, she works systematically, evidence-based yet pragmatically on implementing sustainability solutions and, as a teacher, enjoys to work with the forthcoming generation of change agents.

Main scientific publications:

Albrecht, S., & Wiek, A. (2021): Food Forests – Their Services and Sustainability. *Journal of Agriculture, Food Systems and Community Development*, 10(3), 91–105. <https://doi.org/10.5304/jafscd.2021.103.014>

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Websites:

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