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Alternative Food Networks in Food System Transition—Values, Motivation, and Capacity Building among Young Swedish Market Gardeners

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Abstract: This study sheds light on a new generation of Swedish food producers, market gardeners, who are attracting attention in terms of food system sustainability, prompted by increasing consumer awareness about the value of healthy and locally produced food. Market gardening is part of a global agroecological movement opposed to industrialized agriculture and its negative impacts on the environment and rural communities. These food producers challenge the incumbent agri-food regime through the building of alternative food networks. This case-based study involving 14 young vegetable producers showed that young people who engage in market gardening are strongly motivated by dual incentives, namely entrepreneurship and transformation to sustainability. Six main competences were identified as important for market gardeners: practical skills related to growing vegetables, business management, innovation and continuous learning, systems thinking, pioneering, and networking. Individuals develop their skills through continuous experiential learning and gain knowledge through peer-to-peer learning using social media. However, they need to acquire certain skills relating to their daily work in the field and to managing a business. Market gardeners currently face a number of barriers erected by the sociopolitical environment, in particular regarding access to research-based knowledge, extension services, and business support.

Keywords: agroecology; competencies; food system; lock-in; market gardening; skills; sustainability; transition; urban farming



Citation: Drottberger, A.; Melin, M.; Lundgren, L. Alternative Food Networks in Food System Transition—Values, Motivation, and Capacity Building among Young Swedish Market Gardeners. *Sustainability* **2021**, *13*, 4502. <https://doi.org/10.3390/su13084502>

Academic Editor:
Francesco Caracciolo

Received: 29 March 2021

Accepted: 16 April 2021

Published: 18 April 2021

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1. Introduction

The dominant regime in horticulture and agriculture is currently driven by global markets pushing for industrialized production systems based on high input of non-renewables, large-scale production, and specialization in crops or livestock. This undermines the possibility for alternative, less-intensive production system to compete, creating a productivity paradigm where high-input modern farming practices are key drivers in the destruction of natural ecosystems, loss of biodiversity, and climate change [1].

Outside the mainstream regime, social movements with links to agroecology support initiatives that promote ecological production practices, produce food for nearby markets, and support the local economy, including in urban and peri-urban areas [2]. Usually referred to as “alternative food networks” or “short food supply chains”, these initiatives use various ways to build direct relationships with consumers, e.g., through farmers’ markets, on-farm selling, box schemes, etc. This is boosting entrepreneurship in the agricultural and horticultural sector, not least among new entrants in market gardening and farming, resulting in development of alternative business models and diversification of farms. A European FP7 research project, “Food links: Short Food Supply Chains as Drivers

for Sustainable Development”, showed that short food supply chains in a range of forms contribute to increased food sovereignty, reductions in external inputs, and improved resilience of rural economies. Short chains represent an alternative to the globalized agri-food model and can act as drivers for change [3]. One such example in the food system is market gardening by small-scale organic fruit or vegetable producers who mainly rely on manual labor and sell their produce directly to consumers. These green activists can possibly play a role in the transition of the current food system. The presence of niche players is suggested to be an important factor in technological and social transition processes [4,5]. Niches offer protected space where radical ideas can develop until they are ready for take-off [6]. The conventional food supply chain in Sweden is dominated by a few powerful food retailers [7], so market gardens operate in a niche distinctly separated from the mainstream food system regime. Partly for this reason and partly because of its recent emergence in Sweden, no previous study has examined market gardening in a Swedish context. Market gardeners and other grassroots innovators may already have the solution to some sustainability challenges, as they are managing to run businesses within a regime that has set up considerable barriers to their operation [8].

The overall aims of this study were to provide insights into the situation for young market gardeners in Sweden, identify barriers to development of new sustainable small-scale horticultural businesses, and propose ways in which this group of producers can be supported to overcome these barriers. An additional aim was to explore the potential of market gardeners to enact changes in the mainstream regime, which was done by identifying their values, attitudes, and motivations and relating these to the broader socioeconomic and institutional context for horticulture. The following research questions (RQ) were addressed:

- (RQ1) What characterizes the businesses of young market gardeners in Sweden?
- (RQ2) What motivates young people to become market gardeners?
- (RQ3) What barriers and opportunities are there for new entrants in market gardening?

Theoretically, the study contributes to the literature on food systems transitioning by providing insights into the realities for a group of young vegetable growers who might represent future food entrepreneurs. The study also makes a practical contribution by suggesting focus areas for capacity building and policy development to support young people who want to start a market garden or similar horticultural business.

1.1. Transition of the Dominant Agri-Food Regime

Market gardening is related to the concept of agroecology, which was initially defined as the application of ecological principles in the design of sustainable farm systems [9]. The definition has since been broadened to include interdisciplinary perspectives on how food is produced, distributed, and consumed in an “ecology of food systems” [10]. Agroecology is today considered a scientific discipline, a set of agricultural practices, and a social movement, which in combination gives agroecology the potential to move the current food system regime onto a more sustainable path [11]. Food producers willing to engage in alternative production practices face many obstacles in the political economy of the industrialized horticultural sector. Current incentives to promote specialization, increased farm size, and mono-cultural cropping make it difficult for alternative production systems to compete [12]. It is increasingly recognized that a technology and policy “quick fix” approach will not be enough to address the lock-in of the current food systems and reverse the ongoing damage to eco-systems. Instead, a more fundamental systemic transition that also addresses dimensions of power and inequality in the system is needed [13,14]. In transition theory, experimentation in socio-technical niches plays an important role as a driver of change [6]. A niche is a protected space for testing new ideas and developing new practices, such as organic agriculture, renewable energy schemes, waste recycling, and community housing. These may be selected, protected, or marginalized by existing regimes supporting the dominant practices, structures, and institutions of a particular sector. A niche innovation may gain vitality through either a fit-and-conform empowerment process

or a stretch-and-transform process [15]. In fit-and-conform, the niche innovation becomes competitive in terms of the narrower economic and technological criteria set by the selective environment of existing markets compared with the broader sustainability values that might originally have been the main drivers in development of the niche innovation. The stretch-and-transform approach aims to alter the selection environment in ways that favor evolution of niche initiatives and enact structural changes in the incumbent regime [15].

1.2. Market Gardening, Co-Learning, and Capacity Building

The need for capacity building among market gardeners has not been addressed in previous studies. Information about skills gaps could be important to educators and advisors aiming at supporting new entrants in small-scale horticultural businesses. Learning and knowledge exchange is key to supporting the development of sustainable farming systems [16]. The agroecological practitioner must obtain an understanding of a broad and complex set of biophysical and socioeconomic dimensions of food and agricultural systems. Transition towards more sustainable food systems will also require new forms of knowledge and new processes of learning [17]. However, the capacities needed to practice knowledge-intensive ecological farming are usually not covered in mainstream educational and extension programs, which has been identified as an obstacle to adoption and scaling-up of alternative and diversified farming systems [12]. Engaging in alternative ways of doing farming, like agroecology, means struggling against the subordination of alternative practices to industrial high-input farming and against the conventional understanding of how scientific knowledge emerges, where one side produces and the other side passively absorbs. Cognitive justice, a concept originating in decolonial thought, implies misrecognition due to the knowledge domain and, in effect, devaluation of practical and indigenous knowledge to other forms of institutionalized knowledge [18]. The importance of recognition and integration of different forms of knowledge domains was acknowledged by food system actors in a recent survey performed by the EU-funded Horizon 2020 project “NextFood”. The survey identified an ability to integrate scientific and practical knowledge, and networking with other actors in the food system, as important competences for those seeking to enact change towards a more sustainable food system [19]. In a South American context, the food sovereignty movement La Vía Campesina exemplifies how learning and sharing of knowledge can take place in communities of practice, with active dialogue between different ways of knowing agriculture (*diálogo de saberes*) seen as an important lever to spur collective learning and joint action for change [16]. Mixing external and localized forms of knowledge can contribute to increased resilience in farming [20], but there are few examples of how this can be accomplished in a European context. One exception is a study on a participatory plant breeding network in France, which showed that agrobiodiversity learning is acquired in a process of collective knowledge production and mobilization of different knowledge domains [17].

1.3. Market Gardening in Sweden

In recent decades, structural change in the Swedish horticultural sector has moved towards fewer but larger farms, with the largest 10% of horticultural farms currently cultivating 65% of the total area of field-grown crops and 59% of the greenhouse area [21]. The average size of horticultural holdings is 8.2 hectares (ha) for open field crops [21] and the number of people employed in farming (including horticulture) has decreased to 2% of the economically active population. Further, farmers in Sweden are aging, with 68% of horticultural producers being older than 50 years [21]. Since the focus in the present study was on future challenges, horticultural producers below the age of 35 years, a group that represents 7% of all producers, were selected for interview [21].

Market gardening is a branch of horticultural production, and the term “market garden” has recently been popularized by publication of a specialist handbook and by the emerging “back to the land” movement in Fortier [22]. Family-run market gardens situated near cities were common in Sweden until the mid-1900s, when market competition

increased and forced structural changes in the horticultural sector [23]. Contemporary market gardens are often smaller than one hectare, and a diversity of vegetables and fruit crops are cultivated. It is common to use organic inputs, grow in permanent raised beds, and rely on manual labor. However, the most distinctive trait is that the majority of the produce is sold directly to consumers via farmers' markets, community-supported agriculture (CSA), digital platforms such as online marketplaces on Facebook, or mobile applications such as Local Food Nodes [22]. As part of the "back to the land" movement, market gardening attracts people with no previous experience of professional horticulture. Thus market gardening can be regarded not only as a business model within horticulture, but also as a social movement for self-realization and food system transformation.

There are no official statistics on market gardening in Sweden. The Swedish Board of Agriculture, which is responsible for statistics within agriculture and horticulture, includes businesses with production units on a minimum of 0.25 ha [21]. This covers some of the businesses that identify as market gardens, but growers on production units <0.25 ha operate entirely "under the radar". The principal difference between market gardening and CSA is that market gardening refers to businesses whose main line of production is within horticulture, whereas CSA includes any agricultural or horticultural production [24]. Additionally, small scale is intrinsic to the concept of market gardening, and sales channels other than community-based channels may be used. However, there is significant overlap between the two concepts; a market garden can be a CSA, and vice versa. Many of the CSA farms described in the literature focus on vegetables [20,23], and thus the issues highlighted may also apply to market gardens.

Another indicator of advances in market gardening in Sweden is the recent emergence of courses in small-scale vegetable production. In May 2020, at least 13 courses in small-scale production of vegetables were available to students at Swedish adult education colleges. Several of these have appeared in the past few years. A handbook for aspiring market gardeners by Ringqvist [25], which in many regards is a Swedish counterpart to Fortier's handbook [21], is now available. The two works describe similar production methods, but publication in the Swedish language has facilitated expansion of the movement among grassroots operators in Sweden.

2. Materials and Methods

A case-based qualitative research model was used in the present study in order to better understand and interpret aspects that are difficult to measure quantitatively [24]. This is normally done by analyzing the views, behaviors, opinions, and experiences of people acting in a specific social context. Understanding the values, beliefs, and attitudes of the interviewees, and some characteristics of the complex food system in which they operate, was central to the present analysis. A case study design, which entails detailed and intensive analysis of a single case, for example a community or an organization [25], was applied. Fourteen cases were studied in order to improve emerging theory and gain a deeper understanding of the topic by comparing different cases [25]. Participants were recruited by snowball sampling, in which initial contact with a single food producer relevant to the study topic was used to identify others [25]. A total of 14 participants aged 18–37 years (8 female, 6 male) agreed to take part in the study.

Participants were interviewed for 1–1.5 h using a semi-structured interview guide (see Appendix A) in order to map the situation for young, small-scale vegetable producers in Sweden. This included a description of their businesses, the goals and values that motivate them, their skills and competences, their views on sustainability transition of the food system, and their perceived role in transition. The empirical data were recorded, transcribed, and analyzed using NVivo software [26] and Quirkos software [27]. The transcripts were coded using 39 different codes, of which 35 were decided beforehand and 4 emerged from the data as coding proceeded. Coding was done at the manifest level and at an underlying thematic level. While coding the transcripts, reflections about the coding process were added. The coding was repeated four times by two different researchers (two

times each), so that all relevant statements were assigned a suitable code. The codes were then merged into three main themes. Some of the skills identified as important for market gardeners were explicitly mentioned by the respondents, whereas others were described indirectly and then concretized during data analysis. In all, 23 different important skills and competencies were highlighted by the respondents. These were then grouped into six themes: subject specific knowledge, business management, innovation and continuous learning, systems thinking, pioneering, and networking.

3. Results

The results from the interviews are presented below according to the thematization made in transcript analysis, in the form of (1) general features of respondents' production systems, including firm structure and typical characteristics; (2) specific motives of young market gardeners and factors influencing the situation for market gardeners; and (3) barriers and opportunities for new entrants in market gardening. Results from Section 3.1 is visualized in Table 1.

Table 1. Firm characteristics and demographics.

Component	Description
Respondents	Owners of newly started market gardens
Age	Ranging between 25 and 37 years
Gender	8 females and 6 males
Location	Southern and central Sweden
Settlement	10 rural and 4 urban farms
Educational background	University, business management, or other work experiences
Production	Vegetables with 20–50 cultivars/unit in open field or polytunnels
Farm size	Often less than 1 ha and ranging between 200 m ² and 4 ha
Start of firm	1–10 years ago
Yearly revenue	Mean value €29,000, ranging between €1100 and €100,000
Business models	Alternative food networks; CSAs, farmers' markets, online, on-farm shops

3.1. Description of Production Systems and Business Structure

The respondents were owners of newly started market gardens and were aged 25–37 years (8 female, 6 male). The businesses were located in seven different counties in southern and central Sweden, and four were urban farms and 10 were located in rural areas. Most respondents had some training in farming or business management, often from an adult education college focusing on small-scale horticulture. Some respondents had studied at the university level, and at least three had a university degree, while a few had prior experience of business management. Previous occupations included chef, computer programmer, and international aid worker.

Most of the production systems were less than 1 ha in size (range 200 m² to 4 ha). Production mainly focused on vegetables, with a total of 20–50 different cultivars per production unit and was mainly carried out in open fields or polytunnels. Two respondents had greenhouse production and two had combined vegetable and animal production. One-third of the respondents farmed in systems designed for tractor-driven tools, while the remaining two-thirds farmed in permanent beds, mainly using handheld equipment such as wheel hoes, garden forks, and rakes. Some respondents had equipment designed for market gardening, e.g., quick-cut greens harvesters, rotavators, and two-wheeled tractors. The main source of plant nutrients used was animal manure, sometimes supplemented with compost, bone and blood meal, or different homemade biostimulants. None of the respondents used chemical pesticides or mineral fertilizers.

3.1.1. Financial Situation

All businesses were relatively newly started, with the past 1–10 years, and most were still in a start-up phase where the business was not yet making a profit. Yearly revenue

ranged between €1100 and €100,000 (mean €29,000). Businesses with larger production units naturally had higher total revenues, but the profit per m² was lower than for those with smaller production units. Some of the smallest production units (around 200 m²) managed to make €50 per m², compared with €1.5–3.0 per m² for businesses with production units >1 ha. This variation in revenue per unit area reflected a diversity of production systems with slightly different strategies to achieve a financial balance. Some respondents planned to diversify, some planned to rationalize, and some did not have a defined strategy for long-term financial stability. Some respondents deliberately applied a low-input strategy where revenues exceeded costs, instead of entering a loop of investment and a need for increasing returns:

“We need to cut our costs so we don’t need to make as much money.” (Participant 6)

When asked about optimal business size for the chosen business model, most respondents replied in terms of employment rather than production area or revenue. All respondents aimed to support themselves and their families based on their market garden in the long run, but half the respondents were still financially dependent on incomes outside the business. Therefore, most respondents saw a need for the business to grow from a financial and social perspective, e.g., to be large enough to cope with setbacks.

3.1.2. Business Models

A feature shared by all businesses was that they had short value chains, with produce sold directly to end-consumers through different sale channels, e.g., CSAs, farmers’ markets, online marketplace, and on-farm shops. Half the respondents also reported selling to restaurants and some sold to local supermarkets. One respondent noted:

“So far, we have sold at farmers’ markets and online and various forms of direct sales [. . .] The largest amount is sold directly to the consumer. Otherwise, the whole idea fails, I think. I like this relationship sale where you can look the customer in the eye.” (Participant 11)

Despite having only slightly different approaches to the same value proposition, i.e., organic and locally produced vegetables, the 14 market gardeners interviewed often reported different experiences from using the same sales channels. Some respondents liked farmers’ markets, while others preferred online marketplaces that allowed them to harvest only produce already sold. Some others disliked online marketplaces for their uncertainty, as quantities ordered can vary greatly between weeks. Marketing was done via social media and personal contact. The most frequently cited social media platforms were Instagram and Facebook. Direct sales were considered an important way of marketing, with the personal meeting seen as part of the value proposition. In general, the respondents reported good customer relationships, often highlighting customers as a key partner.

3.2. What Motivates Young Market Gardeners in Sweden?

The perceptions, values, and goals of the respondents reflected the inner driving forces that shape their everyday motivation and long-term lifestyle choices. One respondent said,

“We started this farm partly because it is fun to work with the soil and grow vegetables, but also with an idea of transitioning in mind, that you can produce food in a different way and you can sell it in a different way.” (Participant 1)

This statement clearly indicates the multidimensional nature of motivation and its interconnectedness with both personal identity and the surrounding food system. Market gardening allows the respondents to pursue a personal interest while also creating economic, ecological, and social value in their business and for the community. In a wider perspective, this contributes to what they see as the future sustainable food system, creating a sense of purpose that motivates them to continue developing their business.

3.2.1. Making a Living from Market Gardening

The prospect of generating an income acted as motivation to improve the production and business model. The market gardeners interviewed were determined to support themselves and their families on the income from their business. One respondent said:

“We should be able to live off this and to put money aside, that is the goal of the business. It should be justifiable considering how much work one puts into it.” (Participant 11)

Around 50% of the respondents did not have other sources of income and were instead living on low income and savings. In a long-term perspective, generating an income from their business will be essential to their livelihoods. Although income generation was an important incentive for the market gardeners, it was a business goal, not a personal goal. Many respondents saw making money as secondary to other goals, or simply as a prerequisite to continue with something they enjoy doing:

“The financial part, it permeates it all because we want to support ourselves. But we don’t feel the need to measure success financially, to put it that way.” (Participant 5)

3.2.2. Personal Interest and Wellbeing

All respondents had a personal interest in cultivation. This provided their motivation to pursue an interest that they find creative, stimulating, fun, and challenging. Several respondents had started growing vegetables on a small scale to obtain a more balanced everyday life on a farm, with less stress. However, some respondents mentioned that they were rather stressed about their financial situation, in combination with not getting the necessary financial support from existing support systems that serve other types of businesses. It was common for the respondents to have income from other jobs outside their business to get by. One respondent said,

“It is all about finding a balance in everything, the input/workload and the revenue, which provides for us [. . .] so that you have the strength in a long-term way.” (Participant 10)

For some respondents, cultivating vegetables was therapy, curative as well as preventative. They had started market gardening to heal mentally, through returning to the land and the possibility to control their own workload. One respondent said,

“It was also with a backdrop of a life crisis. [. . .] I thought I needed to have my ‘fingers in the soil’. It’s about being able to feel good.” (Participant 6)

3.2.3. Sustainability Values and Leading the Sustainability Transition

All respondents explained their engagement in market gardening from an ideological standpoint, where they use agroecological production practices and/or organic farming. They saw market gardening as an act of opposing the globalized food system and seeking alternative sale channels to avoid the dominant players on the market. They were also concerned about industrialized agriculture and its negative impact on the environment, and saw market gardening as a means of more sustainable food production. Aspects mentioned were resource regeneration and recycling, soil health, reduced use of fossil fuels in production and transportation, carbon sequestration, biodiversity, avoiding use of pesticides or mineral fertilizers, and contributing to ecosystem health. The respondents viewed the basic premise of sustainability as being a long-term endeavor, expressed for example as stewardship of the soil. In addition, there was a strong emphasis on creating local systems, both in terms of recycling the means for production and in terms of distribution and consumption. The respondents viewed themselves from a holistic perspective and argued that they are part of the solution to more sustainable food production. One said,

“I am thinking of changing society [. . .], but I also think that in order for it to be a real change, there must be some laws and rules about what to do.” (Participant 1)

One respondent described trying to take responsibility for the whole system, from farm to fork, by implementing everything they knew about the soil microflora, plant

requirements, compost techniques, and cooking. Another respondent had a practically oriented approach with a three-point bullet list for sustainability trade-offs: (1) to grow good quality products, (2) to be reasonably profitable, and (3) to be environmentally sustainable. One participant explained that their skills in permaculture design were important in reconciliation of competing sustainability objectives. These examples show that the participants negotiated between different dimensions of sustainability as part of their decision-making process.

Many market gardeners wanted to raise awareness among consumers about sustainable foods and to reach out to new customer segments by organizing courses and other events. For some, spreading the word about market gardening and engaging in public debate to influence policy makers was the single most important part of their business, while others saw it more as an added value or part of their activism:

“[. . .] it is something else that attracts people. There is this view that there is something fundamentally wrong in society, and then you try to change it yourself in an active way. You could get involved in politics too, but if you want to [. . .] well, some of us are more attracted to try for ourselves, influencing from the inside so to speak.” (Participant 3)

3.3. *Barriers and Opportunities for New Entrants in Market Gardening*

3.3.1. Barriers and Opportunities Related to Knowledge and Learning

The majority of the market gardeners interviewed had negative experiences of existing extension services, both official and private, since they did not receive the knowledge and support they needed. One respondent said,

“We have tried, but we have not received help from anyone. Advice can be very theoretical and not so adaptable to our situation. People often think that it is bigger than it is. You only start from large-scale farms when you give advice, perhaps.” (Participant 3)

Only one participant mentioned turning to academic research. The respondents preferred using websites or groups within social media, primarily domestic and international Facebook groups, when searching for knowledge. In the groups, members can ask questions about cultivation or market-related issues and receive knowledgeable replies. Thus, they work as effective platforms for sharing skills and knowledge. Social media was often multifunctional for the respondents, acting as a source of information, a platform for collaboration, and a marketplace. Use of knowledgeable personal contacts, e.g., neighbors or relatives, was also common. The respondents emerged as strikingly competent in continuous learning through experimentation, or “learning by doing”. They reported that they constantly test new ways to solve problems, for example lack of appropriately scaled tools had required some to invent their own tools. One respondent said,

“Well, something I think we had in the beginning is some kind of openness to try new things, we experimented a lot with different crops and so on. I believe we need to maintain that openness, but maybe shift the focus to what we are already producing, instead of trying to produce even more strange things.” (Participant 1)

Lack of Skills in Business Management

Many of the respondents said that they lack training in business management. All of them had basic skills in accountancy in order to comply with legal requirements but wanted to develop their skills in accountancy, budgeting, economic forecasting, and marketing. Some respondents also mentioned a need for skills in providing leadership and in organizing daily work, as the projected growth of their business could require seasonal employees.

Technical Skills Are Learnt along the Way

Several respondents described a need for practical skills, such as mechanics, electrical work, constructing and fixing farm buildings and equipment, and practical skills to

optimize their production systems. They also wanted to learn more about ecosystems to improve habitats for other organisms in the natural environment.

Pioneers Need to Be Good Communicators

Operating outside the established regime within a sector, with the aim of expanding a niche, requires a certain set of skills and competencies. Some relate to innovation to adapt and survive in a market environment. Participants also described a need to constantly justify their business model to both customers and policy makers, which requires skills in communication and teaching.

Networking Is an Important Skill

For many, digital platforms were central to their marketing, to learn new skills, and to communicate with market gardeners across the globe. Nevertheless, digital skills were not mentioned as a high priority by any of the respondents. Instead, they saw these as an obvious and unproblematic component of their daily work. They were members of various networks and initiated cooperation with other local businesses. The respondents demonstrated skills in participatory processes and stimulating local networks with a variety of stakeholders.

3.3.2. Barriers and Opportunities Related to the Political Economy

In general, many respondents felt strong support from their customers, some civil sectors, and each other, but they felt counteracted by the agricultural regime. Specifically, they emphasized a lack of financial support suitable for small-scale producers. Around one-third of the respondents had received start-up support for young farmers offered by the Swedish Board of Agriculture. Others reported that they could not apply because they did not own their own land, their production area was too small, or in one way or another they did not meet the requirements. One respondent had received a grant from a private foundation, and two respondents had received support through LEADER, part of the European Union rural development program that allocates financial support to local initiatives for innovation and cooperation [26]. Most participants were not aware of the different possibilities of applying for financial aid, meaning that the problem was not only scarce availability of financial support, but often also lack of awareness of the opportunities within the existing support system. One respondent said,

“We haven’t been able to squeeze ourselves into a regular program or standard form of any kind. It can be everything from the fact that we don’t own our land so we can’t go to the bank [. . .] or the Federation of Swedish Farmers or the Board of Agriculture think we are too small. And the municipality, they don’t understand what we are up to.” (Participant 8)

Respondents also pointed out that the current direct payment scheme favors large-scale agriculture with low labor intensity, to the disadvantage of small-scale producers. In other words, there was a certain level of distrust in the logic of existing support systems:

“The authorities, and maybe also [the university], need to understand that there is a new generation of farmers, and in this generation, there are those, like me, who need to start from scratch. If we really want to achieve all those goals, we need to support them too and realize that they have different problems than those on a multigenerational farm.” (Participant 4)

The reported difficulties in qualifying for venture capital show that market gardeners are operating in a niche locked outside a strong sociotechnical regime. In interview, the respondents were asked to look beyond the barriers and suggest reforms needed to improve their opportunities to run economically, environmentally, and socially sustainable businesses. Some economic reforms were suggested, such as raising the basic income tax threshold, lowering employer tax, or shifting to an employment-based system for direct payments, rather than the existing area-based system. As implied above, they also saw a

need to change the requirements of, e.g., start-up support, to enable more market gardeners to benefit. Reforms relating to land access were also suggested, such as creating a program for collaboration between market gardeners and large-scale farmers. In all suggestions a general sense of urgency was conveyed, as reflected in the following quote:

“A lot of young people come to us, they see the dream to contribute through farming. They really want to start up and they would do so in an instant if it were economically viable. Losing that resource is the saddest thing there is. There are thousands who want to participate, but we haven’t figured out how to enable them to start. It’s about access to land, it’s about start-up support, it’s about skills development—it’s about society starting to value all aspects of small-scale vegetable production.” (Participant 8)

4. Discussion

This study contributes to the literature by presenting market gardening as an example of food system redesign, and by providing empirical evidence for the link between alternative food networks and sustainability impacts. Market gardening is part of a growing system of alternative food networks producing food that is locally grown and produced with respect for the environment. It is also an example of the food sovereignty movement that has emerged as a consequence of citizens taking the initiative to produce food for their communities, and where responsible use of natural resources is embedded in the farming practices [28]. The results in this study confirmed that market gardeners are motivated by various personal, social, environmental, and economic factors. They strongly believe that market gardening can offer a grassroots alternative to the global agro-industrial food paradigm and that it is a step towards sustainable food systems by enacting a change at cultural and social levels.

Concern for the environment stimulates market gardeners to adopt agroecological farming practices with low levels of inputs and no mineral fertilizers or pesticides. They aim to grow a high variety of vegetables, fruits, and berries on their production units in order to contribute to high agrobiodiversity, while at the same time reducing food miles and supplying seasonal foods to their customers. It is well known that bio-intensive methods, including agroecological practices, have a higher yield output per area than conventional agriculture. Agro-ecological methods are often low-tech and labor-intensive, but are suitable for urban and peri-urban agriculture and horticulture, where farmland is a scarce resource [29]. A previous study on diversified farming systems as a social and economic basis to foster social–ecological conversion concluded that a diversity of knowledge and practices makes a promising alternative to the uniformity of industrialized agriculture when it comes sustaining and regenerating eco-system services, while comparing well with industrialized agriculture in terms of productivity (Marchetti et al. [30]).

Non-monetary rewards, such as meeting family needs, personal interests, and life satisfaction, were mentioned as important incentives by the market gardeners interviewed in this study, but economic aspects were also important for their commitment. The possibility to make a living out of market gardening must be ensured if the business is to survive in the long term. The respondents explained that they accept a low income because they are new entrants to gardening, and therefore inefficient. They believe profitability will increase when they have improved their practices and established a network of loyal customers. A striking characteristic of all market gardeners in this study was the entrepreneurial aspect of their motivation, i.e., they were determined to pursue ideals through entrepreneurial activities. In other words, given their ambition to find alternative ways to produce and distribute food and to contribute to food system transition, they can be described as typical “social” or “sustainability” entrepreneurs, striving for sustainability transformation while at the same time making a living from it [31].

There are clear links between the conditions and change of food systems and political ecology, because of the explicit considerations of relations of power [32]. Political ecology studies have uncovered social, environmental, and economic unfairness in the contempo-

rary global food system and point out that finding solutions to the sustainability crisis will require a major rethink and political and social change, and not merely the addition of new technologies. According to De Molina, et al. [33], political agroecology is based on the fact that sustainability cannot be achieved using only agronomic and environmental innovations but needs a fundamental change in the institutional framework through collective action by social movements. In this respect, market gardeners can be seen as transformational change agents, since their business model questions the shortsighted neoliberal principles structuring and governing current food systems. By opposing mainstream food system actors, and sidestepping intermediary retailers and wholesalers, market gardening seeks to contribute to redistribution of power and fair income for farmers. The tendency to build strong lateral connections with other market gardeners, and not with representatives of the mainstream agricultural sector such as retailers and policy makers, is a result of their ambition to oppose industrialized agriculture and the globalized food system. It is obvious that they do not engage in farming to conform with the conventions and standards of mainstream agriculture, but rather apply a clear stretch-and-transform strategy [15]. They seek to build a tight relationship with their customers, whom they see as their closest business partners. The market gardeners interviewed in this study tried to stay independent of the current regime, but also expressed frustration at being marginalized by the existing framework for financial support to small-scale farmers. This locks out social innovation in the food system. The respondents wanted supportive public policies targeting alternative small-scale farmers that could help them develop persevering and thriving businesses. Our results are in line with Bruce and Castellano [34], who showed that the high degree of unpaid labor for producing foods prevents increased participation in alternative food networks. Strengthening market gardening management capability through “ecological entrepreneurship” skills training could be one way for advisors and educators to support the long-term sustainability of market gardening.

Competencies in horticulture and organic farming practices are of course very important, especially since market gardeners grow a diversity of crops. It is known that farmers usually make better choices for enhancing the sustainability of farming systems when they have access to various forms of knowledge [35]. All the market gardeners in this study obtained most of their information and knowledge from peers via virtual networks like Facebook. This was because they found it a reliable source of information, but also because they had experienced non-productive interactions with the mainstream extension services. Other examples of peer-to-peer learning can be found within the agroecological movement worldwide. In Latin America, the Campesino-a-Campesino (Farmer to Farmer) movement has promoted agroecological techniques for the past 35 years [16]. Conventional farmers transitioning towards organic agriculture use multiple sources of information in their personal network (family, neighbors, web forums) and more conventional sources (agricultural press, cooperatives, official and private extension services) [36].

Although the study was carried out in a national Swedish context, the results have been discussed in the perspective of published literature presenting empirical work from other parts of the world, which should make this study relevant also beyond the Nordic countries. Our study presents a snapshot of an emerging phenomenon in the food system and it would be interesting to perform a longitudinal study on how market gardens develop over time in relation to a changing socio-political environment. To support policy-making in the area of sustainable food systems, we suggest to contrast market gardeners with other transformational food producers, such as high-tech vertical farmers, in particular when it comes to the sustainability impact and the adoption of knowledge and innovations.

Market gardening is in line with the concept of “eco-economy” (Marchetti, Cattivelli, Coccozza, Salbitano and Marchetti [30]), a bottom-up strategy for the development of local food networks that represents an oppositional act to the global agri-industrial paradigm. Eco-economy is a model for food production that captures local and regional value between rural and urban spaces through a network of small and medium-sized businesses and economic activities. These utilize ecological resources in sustainable and ecologically

efficient ways that do not result in net depletion of resources but instead add value to both rural and urban spaces. This model is already evolving in several places within and beyond Europe, working against the globalization of food systems and taking back control over how the food is produced. Importantly, these initiatives also re-establish connections between food production, the local environment, and local social conditions. Because of a variation in different types of alternative food networks, it is difficult to establish a clear link between the concept and sustainability outcomes [37]. In this study, we have shown that market gardeners directly contribute to environmental sustainability by the adoption of agroecological practices and by the reduction of food miles. Their businesses help them to fulfil personal social goals, but the amount of unpaid work poses a significant challenge to economic sustainability.

5. Conclusions

This study showed that young vegetable producers who engage in market gardening are social entrepreneurs, dedicated to make a living out of their businesses, while at the same time seeking food system change and more ecologically based, sustainable horticulture. These market gardeners face multiple barriers related to the existing political economy of industrialized agriculture, in particular regarding access to research-based knowledge, suitable technology, extension services, and business support systems. The skills they lack relate to daily work in the market garden, such as cultivation of vegetables and financial management. This skills gap could be overcome in a relatively short-term perspective by increasing the focus on finance and entrepreneurship in existing adult education courses and by developing extension services that can provide short and practically oriented courses in vegetable cultivation techniques for small-scale systems. To encourage more young people to start market gardening and contribute to the transformative agenda, there needs to be greater awareness of the characteristics and needs of market gardeners among extension workers, researchers, and policy makers.

Author Contributions: Conceptualization, A.D., M.M., and L.L.; methodology and software, A.D., M.M., and L.L.; validation, A.D., M.M., and L.L.; formal analysis, A.D. and L.L.; investigation, L.L.; resources, M.M.; writing—original draft preparation, A.D., M.M., and L.L.; writing—review and editing, A.D., M.M., and L.L.; funding acquisition, M.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research was partly funded by the European Union, through the Horizon 2020 project “NextFood”, Grant agreement No. 771738. The APC was funded by the Horizon 2020 project “NextFood”, Grant agreement No. 771738.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Acknowledgments: The authors wish to thank the market gardeners who agreed to participate in this study. Your input provided the backbone of this study and it would not have come into being without you.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Introduction: Presentation of the interviewer and purpose of the study. Thank you for wanting to join. Ask about recording and guarantee anonymity. Are there any further questions?

Description of the owner and business characteristics

1. Which county are you active in?
2. How old are you?
3. Do you identify your gender (male, female, other)
4. Do you have any education in horticulture or business?
5. What area do you cultivate? (outdoor and greenhouse)

6. What is your production focus?
7. What do you grow?
8. What machines or technical aids do you use in cultivation? What are they used for?
9. What are your main sources of plant nutrition?
10. Do you use chemical pesticides?
11. How many people work in the company? All year? Season?
12. How long have you been working as a professional grower?
13. Did you start the company yourself or did you take over an existing company, such as a family business?
14. Do you have any other employment besides the farm?
15. Have you received grants or support, e.g., investment or start-up support?
16. How big is the company's turnover?

Theme 1: Motivation

- 1.1. What is the goal of your business? What is your vision?
- 1.2. What drives you to continue with the business?
- 1.3. What does the business model look like?
- 1.4. What is the right size for a company with your business model?
- 1.5. Who are your most important partners in the daily work?
- 1.6. What other actors do you have professional contact with? (suppliers, consultants, researchers, customers, other entrepreneurs in the same sector, authorities).

Theme 2: Skills and competences

Introduction: Skills can be learned in a relatively short time and are limited, for example technical skills, such as driving a tractor or wheel hoe, and digital skills, such as being able to use social media or Excel. Competences are linked to a specific context, in this case food systems, and are more complex. They often include both knowledge and skills, such as problem solving, critical thinking, business planning, leadership.

- 2.1. What are the most important skills and competencies in your daily work?
- 2.2. Compared with when you started cultivating, what new skills and competencies have you had to learn?
- 2.3. Are there any skills and competencies that you no longer use as much?
- 2.4. What skills to succeed better with your business do you feel you lack?
- 2.5. As you look into the future, what skills and competencies do you think you or your employees may need to develop?
- 2.6. When you think you need a new skill, competence or knowledge, where do you turn? (ask about the following actors: relatives, other entrepreneurs in the same sector, experts, local contacts, advisers, universities, market participants if the interviewee does not mention them voluntarily).
- 2.7. Which of your current knowledge and skills will become more important in the next 5–10 years? Why?

Theme 3: Sustainability and adaptation

- 3.1. What is sustainable food production for you? That is, what is included in your understanding of the concept? (ask about social sustainability, economic sustainability, and environmental sustainability if the interviewee does not mention them voluntarily)
- 3.2. What role does sustainability play in your daily work? Do sustainability goals shape your daily work? On which way?
- 3.3. Which of your skills or competencies contribute to making your food production and/or your business more sustainable? What are your most important skills and competencies when it comes to sustainability?
- 3.4. How does your company contribute to society as a whole achieving the global goals for sustainability development? (ask about Sustainable Development Goals such as Combating climate change, Reducing inequality, Sustainable consumption and production, Marine and marine resources and Ecosystems and biodiversity)

3.5. Which actors support you in your sustainability work? (ask about other companies in the same sector, advisers, educational institutions, associations if the interviewee does not mention them voluntarily)

3.6. What do you think about the concept of conversion?

Final question: Is there something we have not discussed that you think is important to better support young gardeners, bearing in mind that the societal goal is economic, social, and environmental sustainability?

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