Towards Sustainable Urban Food Systems: Potentials, Impacts and Challenges of Grassroots Initiatives in the Foodshed of Muenster, Germany

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Abstract: Solving fundamental sustainability challenges in our food systems requires political, institutional and socio-technical transformations. Indeed, sustainability transitions are needed. In this paper, we explore the role of civil society in the form of bottom–up grassroots initiatives in the transition towards a sustainable urban food system and examine their potentials, impacts and challenges in the foodshed of Münster in Germany. To this end, relevant initiatives in Münster have been researched and mapped according to explicit criteria, and case studies have been compiled for two of them using questionnaires, interviews and desk research: a community-supported agriculture (CSA) farm Entrup 119 and an urban gardening initiative GrüneBeete e.V. The results indicate that many initiatives in Münster focus on education and information, i.e., raising awareness, rather than offering material alternatives. Six initiatives were studied in more depth using desk research and a questionnaire. Key leverage points identified by the initiatives are in policy, education, networks and communication. Two of these were studied as cases. We see these transition pioneers as paradigmatic role models, providing room for experimentation, social learning and empowerment.

Keywords: city-region food systems; community-supported agriculture; multi-level perspective; sustainability transitions; sustainable food systems; territorial food systems; urban agriculture; urban agriculture

1. Introduction

Nowadays, there are more people living in cities than in rural areas [1]. Urban populations are continuing to grow while space is becoming more scarce. As a result, cities depend on food production that takes place outside their boundaries. Their dependence on global markets makes them vulnerable to food insecurity [2]. At the same time, activities in cities worldwide—both directly and indirectly—are among the most powerful drivers for global environmental problems such as climate change, soil depletion and biodiversity loss [3]. This in turn affects agriculture as the basis of our food system. In addition, there are other challenges such as fair distribution and access to food, unhealthy diets, or the loss of nutritious value due to methods of processing and preparation. In order to respond to these developments in a way that ensures food security for everyone, our food systems will have to change.

In its simplest form, a food system (FS) is conceptualised as a chain of activities that ranges from food production to its consumption [4]. However, our FS are more complex in nature: they are not only comprised of a straight line of stages but being socio-technical systems fulfilling a societal function, they consist of a cluster of elements such as infrastructure, technology or supply networks [5]. They also include sub-systems such as input supply systems and interact with other key systems such as the energy or trade
A broader definition of FSs therefore includes the array of interactions between bio-geophysical and human environments and also considers the multiple actors involved, allowing for assessing food systems in their multi-causal complexity as far as possible [4].

The study of foodsheds plays a major role in food system research. Rather than being congruent with administrative structures, foodsheds are defined as the territory around an urban core that is required to feed its population; it includes both urban consumption as well as peri-urban production [7]. The reshaping of urban FS by reconnecting cities with regional food production might not only promote food security but also bring about numerous other benefits such as social participation and inclusion, ecological embeddedness, and reduced food miles [7]. With complex systems being prone to inertia [8], however, the change that is necessary might be difficult to achieve in time.

Solving fundamental sustainability challenges requires political, institutional, and socio-cultural transformations. As incremental changes will not suffice to cope with the prevailing sustainability challenges [9,10], a transition is needed. The research field of sustainability transitions (ST) applies theories and methods from various disciplines to study the history, dynamics, and governance of transitions for addressing change at systems level. Its intention is to integrate multiple themes and to detect ways for a system to make a structural, qualitative shift to a more sustainable state [11–14].

By 2019, “sustainability transitions literature has increasingly recognized the importance of civil society and social movements” [15] (p. 17). As networks of activists, grassroots initiatives have innovative potential and may generate novel bottom–up solutions for sustainable development that are in contrast to mainstream business greening [16]. One approach to facilitate ST in the food sector in which civil society and social movements play a role is creating narratives involving Alternative Food Systems (AFS) or Alternative Food Networks (AFNs). These oppose the highly organised, vertically integrated, industrial FS, and they can be starting points for ST in the wider agri-food arena [17].

From the perspective of urban grassroots initiatives and social innovations, ST are driven by heterogeneous approaches of civil-society actors in cities. The focus of this research epistemology lies on the abilities and opportunities of the initiatives to promote and scale their innovative practices [18,19]. Transition pathways can enfold in different contexts which each have their own particularities and possibilities, and findings may not always be transferred easily from one place to another. Because of that, an explicit geographical perspective is needed, increasing the practical relevance of transition research.

In this context, this article aims to explore the role of civil society—in the form of bottom–up grassroots initiatives—in the transition towards a sustainable urban food system, and to examine their potentials, impacts and challenges in the foodshed of Münster (Germany). To do so, relevant initiatives in Münster have been researched and mapped, and case studies have been carried out on two of them: community-supported agriculture (CSA) farm Entrup 119 and urban gardening initiative GrüneBeete e.V.

2. Material and Methods

2.1. Study Area: Characterisation of the Urban Foodshed of Münster

The city of Münster in North-Rhine Westphalia, Germany, has a population of over 311,000 [20] and is continuing to grow. The Münsterland region, including Münster and the neighbouring districts Warendorf, Steinfurt, Coesfeld and Borken, is strongly shaped by agriculture, with 66% of its area being agricultural land. The production and processing of dairy, beef and pork products play a huge role as well. However, production is mainly oriented towards global markets rather than local food supply, and only 6% of local crops are suitable for direct marketing. With only about 1%, less land is used for organic farming than in the rest of North-Rhine Westphalia [21]. An online consumer platform lists 127 supermarkets and discount supermarkets in the city of Münster, most of them chain stores; additionally, the city itself lists 21 farm shops and 23 weekly markets [22,23]. Albeit Münster having 55 allotment clubs with 5700 members in total [24], these gardens have become places of recreation and decoration rather than being used for growing food,
and they are decreasing in number and size [1]. However, the city of Münster does offer favourable conditions for ST. For instance, as the winner of the German Sustainability Award in 2018, the city has decided to devote its prize money to the development of school gardens, facilitating (urban) gardening to find its way into the education system [25].

2.2. Methods

The research in this project builds upon the paradigm of reflexive interpretivism as epistemology and constructivism as ontology, presuming that “reality” is socially constructed, and focusing on how the groups of actors themselves construct the answers [26–29]. Accordingly, the context, processes, outcomes, etc. will be described as seen by the initiatives themselves, trying to understand them on their own terms. In order to make transitions socially robust and sustainable, it is essential to understand the motives and strategies of the actors. In addition to focusing on actors and networks that influence decisions and the initiatives’ development, the internal governance of processes and resources is emphasised—i.e., learning and experimentation, network management, advocacy, and dissemination [18].

The most prominent framework to examine and analyse transitions is the Multi-Level Perspective (MLP) [30,31]. It considers three conceptual levels, whose interactions constitute transitions: the socio-technical regime, which refers to the shared cognitive routines, practices and rules and stabilises existing systems, niches, which offer safe spaces apart from the regime rules where innovations can be developed, and the socio-technical landscape, which is the exogenous environment regime that niche actors cannot influence directly. Systemic change is a result of multi-level interactions. When landscape pressures act on the regime, windows of opportunity may open for niche innovations to break through, enabling a transition of the incumbent regime [32,33]. Since ST research has concentrated mostly on energy and mobility systems, emerging frameworks are mainly concerned with these sectors. El Bilali and Probst [34] therefore suggest an integrated framework to accommodate agro-food transitions that combines MLP with elements of other transition frameworks. Their proposed framework was used in this research.

To analyse the role of grassroots initiatives in the transition towards a sustainable urban food system in the foodshed of Münster, a mixed methods approach was applied. A general literature review on ST as well as additional literature on CSA and urban gardening for the case study evaluations served as a basis. The literature, both German and English, was searched online in the ULB catalogue of the Münster University and State Library, the database of the FH MUAS (Library catalogue DigiBib), on ScienceDirect, as well as with the search engine Google Scholar. Based on this, a “screening” of the relevant grassroots initiatives in the foodshed of Münster was carried out. “Sustainable” organisations, initiatives, projects, shops, etc. in and around the city of Münster were collected via desk research by the research team and categorised according to their area of activity. The specification of characteristics of grassroots initiatives used was based on the literature review and “Beacons of Hope” questionnaire of the Biovision Foundation for Ecological Development & Global Alliance for the Future of Food [35], and the list of initiatives was refined using the screening criteria in Table 1.

The initiatives fulfilling all four screening criteria were profiled based on desk research and qualitative, semi-structured, face-to-face interviews with key informants. An interview guide based on a checklist with “W” questions was used. The background of the research project was set out verbally prior to each interview. The initiatives were contacted using the contact details indicated in the imprint of the website, and/or personally, in each case asking for long-term, active members with sound knowledge of their initiatives as interview partners. In total, nine participants of the six initiatives were interviewed, with an average interview duration of one hour.
Table 1. Description of screening criteria.

| Screening Criteria | Description |
|--------------------|-------------|
| 1. Initiative      | Organisational boundary (see above for specifications) |
| 2. Foodshed of Münster city, Germany | Spatial boundary: Place based—located in or around the city of Münster, whereby not the municipal boundaries are decisive but the actual contribution of the initiative to changing Münster’s food system/food supply |
| 3. Food and/or agriculture | Thematic boundary: Contextual focus of the initiative’s work |
| 4. Time of existence/transition duration | Temporal boundary: Active for at least two years |

The insights gained through the mapping of the selected initiatives were expanded by studying two exemplary cases that provide more detailed, specific insights. For their selection, sub-criteria were defined to complement the initial screening criteria, taking into account the initiative’s impact so far as well as a focus on the whole food chain. For data collection and analysis, additional semi-structured interviews using an interview guide were conducted for the cases, and results were coded and summarised using the Beacons of Hope checklist and questionnaire. All interviews were audio-recorded with permission.

Study Limitations

The idea of researching transitions is itself an act of governance that requires continuous, critical reflection [12,36]. Both theory and results are based on the authors’ understanding and perception of the research field, and because of the origins of transition scholarship, a North–West European bias is likely. Furthermore, the selected initiatives constitute only a sample taken from a wider, emerging transition network or movement. Causality problems do not permit predicting the exact point in time and success of transitions. The actors actively involved frequently are not aware of being part [37]. According to Avelino [26], initiatives that do not speak in “transition terms” may even have greater potential, but the question of whether lessons from transformations in one sector and region can be generalised still must be answered [37]. Since grassroots movements act in their local context, it is also important to take local differences into account.

3. Results and Discussion

The results are presented according to the steps of the research design, starting with the results of the overall screening before presenting the six selected ST initiatives in the foodshed of Münster. Finally, the two case studies are introduced in more detail.

3.1. Screening of Grassroots Initiatives in the Foodshed of Münster

In total, 49 initiatives linked to food and ST were identified. The four screening criteria were applied to all initiatives, resulting in a reduced number of 36 initiatives that fulfilled two or more criteria and nine initiatives that met three or all four criteria.

The initiatives act at different stages of the food chain (Figure 1). Multiple answers were possible (e.g., consumption and education); 13 (36.11%) of the initiatives that fulfil two or more of the criteria (n = 36) are mainly active in food production, three (8.33%) can be located in the area of processing, six (16.67%) are in distribution or trade, eight (22.22%) are in consumption, and two (5.55%) are in food waste. In addition, nine initiatives (25%) are active in the area of education, two are in the policy area, one is active in the transport sector, and another one in the area of housing (plus a currently inactive umbrella association). These results indicate that many grassroots initiatives in Münster focus on education and information, and hence awareness raising and internal change rather than offering material alternatives.
Of the initiatives compiled in the first step (n = 49), 34 contribute to the ecological sustainability pillar, 27 (also) contribute to social sustainability, and 18 (also) address economic sustainability. Here, too, multiple answers were possible. While the ecological sustainability dimension seems to stand out, in many initiatives, the sustainability pillars are interwoven, and all three areas are represented in their activities. Cases in which drawing clear distinctions was difficult were attributed to the sustainability pillar(s) most ostensible, e.g., consumption and/or education initiatives to the social pillar. The distribution of the criteria fulfilled was relatively even, with any one criterion being fulfilled by 20 to 25 initiatives.

3.2. Mapping of Six Sustainability Transitions Initiatives

The six initiatives that met all four screening criteria were selected for a more in-depth study. They are briefly introduced below (Table 2).

Table 2. The six mapped initiatives.

| Initiative Name            | Description                                                                                                                                                                                                 |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CSA farm Entrup 119        | It is a CSA farm less than 20 km from Münster’s city centre. It developed as a countermovement to the widespread industrial farming in the Steinfurt district and seeks to strengthen and sustain an economically, ecologically and socially sustainable, alternative model to conventional agriculture by farming and processing food biodynamically. It is therewith active at all stages of the value chain. |
| Foodsharing Münster       | It is part of an international Foodsharing network. It collects food from cooperating grocery stores and other places with leftover food (including private households) that would have been disposed of otherwise (e.g., because it reached its expiration date or is otherwise flawed). Foodsharing seeks to raise awareness for food waste as well as an appreciation for and redistribution of food. The initiative’s focus lies on the end of the food value chain, focusing on consumption and waste. |
| GrüneBeete e.V.            | It is an urban gardening initiative that started out as a student project in 2013, which is shortly followed by the foundation of the association in 2014. The initiative’s aim is to implement urban agriculture in diverse forms and to share information about it with all interested parties to raise and anchor awareness of environment and resources in society. |
Table 2. Cont.

| Initiative | Description |
|------------|-------------|
| Laakenhof GbR | It combines communal living with operating a farm. The intentional community strives for living and working together as equals and responsibly managing the common money as well as for an ecological, resource-efficient behaviour. With its twelve members, the initiative poses a visible alternative to conventional forms of living and farming and also sells its sustainably produced products. Adhering to a circular economy, the initiative is active at all stages of the value chain. |
| Münster iss veggie | Its aim is a reduction in meat consumption in Münster, especially by pointing out the palatability of vegetarian dishes. With a focus on communication and offering alternatives instead of morally pointing fingers, it tries to reach both gastronomy and private households, e.g., with talks, workshops or information stands on the effects of food on the environment and health and its social impact. The initiative is active primarily at the stages of trade and consumption. |
| Slow Food Youth Münster (SFY) | It is part of the German Slow Food network. Founded in 2014, it describes itself as a movement of young people who are committed to a sustainable food system and the goal of networking the different local actors of the value chain. Among its aims are the preservation of peasant agriculture and traditional, artisanal food manufacturing, protecting biodiversity, waste reduction and increasing appreciation for and pleasure in food. SFY Münster is active at all stages of the value chain. |

Social sustainability plays a pivotal role in all grassroots initiatives, including the mapped ones. This becomes especially relevant when considering the systemic nature of transitions, involving lifestyle and behaviour changes. The two organic farm communities encompass all three sustainability pillars. The GrüneBeete community garden applies organic principles and methods but has a focus on socialising, similar to SFY Münster that also emphasises social even more than ecological sustainability.

3.3. Case Studies

Of the six initiatives mapped, two (i.e., CSA farm Entrup 119 and urban gardening initiative GrüneBeete e.V.) have been selected for detailed case studies. They do not only fulfill all four screening criteria but also three (in the case of GrüneBeete) or all four (in the case of Entrup 119) criteria of AFSs [17].

3.3.1. Conditions: Regime and Landscape Trends

As the landscape and regime conditions are relevant for both cases and answers mostly overlapped, the results from all interviews with both Entrup 119 and GrüneBeete representatives have been summarised in Table 3.

Table 3. Regime and landscape trends as seen by Entrup 119 and GrüneBeete.

| Regime | Landscape |
|--------|-----------|
| • Global markets, supermarket chains and large-scale, corporate producers/processors in global markets | • Overarching logic: paradigm of economic growth |
| • Low share of the income spent on food in Germany | • Globalisation trend → $\frac{1}{3}$ of revenues spent on food of domestic origin |
| • Industrialisation of agriculture | • Urbanisation trend → farmland lost to urban sprawl |
| → Short crop rotations, monocultures | • Environmental pressure on farmland increasing |
| → Specialisation instead of variety | • Individualisation trend → wide product range offered by food industry; mainly processed, standardised food |
| → Use of fertilisers and pesticides threatens biodiversity | • Growing awareness of environmental topics and food production conditions in society perceived by all interviewees |
| • EU subsidies rewarding size rather than ecological criteria | • Number of animals not bound to farmland area; even higher than average in Münster |
| • Number of animals not bound to farmland area; even higher than average in Münster | • Only 1% of all farms in/around the city managed organically (below German average) |
| • Only 1% of all farms in/around the city managed organically (below German average) | • Organic agriculture increasingly adopting rules of conventional industry (e.g., larger operational structures, price dumping) |
| • 2/3 of food waste in Germany caused by private households | • 2/3 of food waste in Germany caused by private households |
| • Disconnection of urban consumers from food production; anonymity | • Disconnection of urban consumers from food production; anonymity |
| • Gardens for recreation and decoration rather than food production | • Gardens for recreation and decoration rather than food production |
3.3.2. Case Study 1: CSA Farm Entrup 119

The Initiative Entrup 119 e.V. purchased its farm with twelve hectares in 1999, with the help of private donations and loans. In 2006, the cooperative Gärtnerhof Entrup e.G. was founded to manage the farm operationally. The CSA community was founded in 2008 to co-finance the farm with monthly member contributions. The initiative counts about 100 association members, 88 cooperative members (with at least one share), and 148 CSA members (with \( \frac{1}{2} \) to 1 harvest share). The members are actively involved in the farm and have a say in the production process. The initiative has undergone several phases of internal transitions since its founding.

**CSA as Radical Niche**

Representing an alternative to conventional agriculture in the current regime, organic farming can still be seen as a niche, albeit growing. CSA, often applying organic practices even if not certified organic, is even described as a “niche within a niche” by one interviewee. According to Göpel [38], “[a]n activity is pioneering if the solutions it promotes differ radically from the status quo” (p. 22). CSA is intended to support a paradigm shift in the agricultural sector, economic system, and human understanding of and relationship with nature [39]. Instead of the individual being replaceable as in the industrial food system, in light of the holistic approach of biodynamic agriculture, the initiative’s members speak of a “farm organism” and “farm individuality”, implying radically different worldviews. Therefore, the initiative can be viewed as a radical grassroots niche. Regarding the farm cooperative, the *niche* is the alternative economic model, enacting change via practice that the association, in turn, enables. The tripartite form of organisation, dispersing responsibility across many different shoulders, is both new and special. As a living laboratory for innovation and system change in almost all areas of life, the initiative experiments with new forms of community farm management, economy, cultural norms and values, relationships etc., using and developing diverse (grassroots) innovations and methods.

**Social Relations and Practices**

Changing social relations, including new ways of acting, framing, organising, and/or knowing, equals challenging, altering, and/or replacing institutions, and hence the structure of local practices. CSA involves changing relationships at the interpersonal level. Sustainable agriculture builds on a stable basis of trust that needs constant work. Trust is built and promoted through spatial proximity and, in turn, fosters social proximity or relatedness [1]. Know-how is needed for putting CSA into practice, not only including cooking from scratch but also organisational, managerial as well as social competences. Dialog and encounter of the different actors first must be relearned—as must be appreciation, the practice of giving and taking (expressed in the notion of “Teilgeber” used in the CSA context, meaning “sharegiver”) implying a different concept of collaboration throughout the whole food system [40]. According to one of the interviewees, resolving conflicts and interacting with each other is what CSA is about. This social togetherness cannot be prescribed but must develop. The social capital the initiative can create by networking on the different levels (e.g., with NGOs and regime actors such as the local municipality) significantly influences effective feedback, learning and, ultimately, the development of new, better solutions [41]. Joining a CSA requires a change in food-related practices for most people and signals openness to change [42,43]. In addition to financing the farm in exchange for a harvest share, the “CSA practice” includes attending social events and open days, helping to grow produce, exchanging recipes, administration/organisation, and/or helping to pack and deliver the produce [44]. The activities implied by CSA membership, e.g., planning meals around the weekly share, differ from the dominant ones that suggest that consumers are in full control over the What, Where, and When of food. New members must learn from the community how to adjust their activities to the new practice [43].
Multi-Level Interactions—Linkage, Breakthrough and Developmental Path

In the case of Entrup, anchoring is characterised by integrating the local community into the farm operation through shares (i.e., network anchoring; [45,46]). Through consumers who decide to buy organic, regional food directly (e.g., at farmers’ markets), and/or to join the CSA community, market formation takes place. The new infrastructures, processes, and practices the initiative created such as the cooperative and CSA can be seen as partly technological anchoring. However, as an alternative economic model, it bypasses the conventional market rather than anchoring with the regime. The concept of CSA is not yet codified at the regime level; institutional anchoring did not take place so far. Niche actors need to develop political capacity to mobilise support, influence agendas, and re-direct investments and policy commitments towards radical transition [32]. In this context, one interviewee identified the reallocation of subsidies as a potential lever. Niche actors also typically depend on support from pioneering actors within regime institutions for their solutions to become part of a transformed system configuration, e.g., a German Green Party politician in the case of Entrup. Actor networks built in niches might carry the innovations to the regime so that they eventually become adopted by society [37,38,47]. Legitimacy is gained through the legal form (e.g., non-profit status of the association), the members themselves and their networking, as well as through projects and research. The initiative, highlighting social issues such as solidarity in its marketing, and combining the two legal forms of a non-profit association and a cooperative, engages with institutions (e.g., schools) and the public, raising awareness in society (e.g., through events). There are contacts to and product exchanges with other farms. Ethics and civil-society arenas in particular—already the main foci of the association—bear the potential to further increase legitimisation. Some linkage channels, e.g., projects, subsidies, and policy measures, are subject to the contingencies of funding, policy change and network composition, and hence can be periodic, fragile, or short-lived [48,49]. As AFS, the initiative emerged outside the prevailing food regime, coexists, and mostly remains on local level, in its niche—with its own structures and pathway, and few interactions with the regime (except for individual actors). So far, Entrup is neither actively competing with the regime nor have landscape changes destabilised the regime enough to pave the way for a niche to establish a new regime.

Sustainability Dimensions

Entrup contributes to ST through (enabling) sustainable food production, processing, and consumption. In general, the more dimensions are driven towards sustainability, the higher the impact of an initiative and its contribution to broader ST [34]. Entrup’s actions in general in the different sustainability dimensions and those of CSA farms are presented in Table 4.

Scaling up/out

For the initiative itself, the goal is to expand the CSA community to 150–200 people, i.e., not more than the farm can feed now. Qualitative, organic, sustainable growth is preferred over quantitative growth. To establish a more solid (financial and personal) base for upcoming developments, the number of members in the cooperative is to be steadily increased over time. In the future, when extension is feasible, networking as well as better interlinking the CSA community, cooperative, and association could expand the initiative’s scope and resource repertoire and make it possible to reach more target groups. One main intention of the association is spreading the idea. The translation of ideas rather than technical solutions proves difficult. In addition, there might be resistance within the niches themselves to the extraction and separation of ideas and practices from their value settings [48]. Scaling most likely will imply intensified contact with regional authorities as well as with national, European, and international policy. As CSA is an inherently local approach, many initiatives’ capacities for structurally advancing the concept are limited. They instead focus on consolidating their “economic organism” in their context, resulting in diverse local forms, some being more mature than others. These spatial differences make it difficult to generalise CSA [39]. According to one interviewee, the concept has
potential as a future food and farming system. The fact that France is leading in Europe with more than 2000 CSA farms, 100,000 members and 4000 farms as well as progressed institutionalisation [50] points to the need for both organisational network structures and policy support for scaling CSA. Applicable everywhere (in both urban and rural areas), it displays high scaling potential, in particular for small family farms and farm alliances as well as for rural areas.

Table 4. Entrop 119’s effects on different sustainability dimensions.

| Environmental Sustainability                                                                 | Economic Sustainability                                                                 | Social Sustainability                                                                 |
|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| - Re-establishing connection between people and the land that feeds them                      | - CSA as lived solidarity economy                                                      | - CSA farms both use and generate social capital through the networks they create     |
| - Farmers as environmental stewards, assuming responsibility for the land                   | - Members lay the necessary foundation for investments that an individual could not afford | - Increased quality of life of members, as well as job satisfaction of employees        |
| - Sustainable land management according to organic or biodynamic principles/standards        | - Local employment and trade                                                           | - Food sovereignty                                                                      |
| (closed-systems approach, minimising external inputs, and hence resource use)               | - Local employment and volunteering options                                            | - Strengthening of rural areas and facilitating exchange between urban and rural living worlds |
| - Contribution to biodiversity and carbon sequestration, hence providing more public goods than conventional farming | - Members’ connections can help with land search, mobilise local support to acquire or keep land and/or provide funding (e.g., donations, investments, advance payments of crop shares), moving away from dependence on EU subsidies | - Enhanced well-being of participants                                                  |
| - The cooperative provides ecosystem services by putting biodynamic, multifunctional agriculture into practice | - CSA principles differ from economic growth paradigm                                   | - Research/development of biodynamic agriculture fostering the preservation and expansion of knowledge |
| - The association contributes to biodiversity through nature conservation, research and development, and breeding | - Provision, education, training, and volunteering opportunities indirectly build economic potential | - “Demonstration farm” sharing methods and best practices with other farms and society |
|                                                                                             | - Long-term resilience: values and different forms of capital stay in the region.       | - Farmers benefit from skills members bring in                                         |
|                                                                                             |                                                                                        | - The initiative is built on community culture                                        |
|                                                                                             |                                                                                        | - The cooperative provides social services by putting biodynamic, multifunctional agriculture into practice |

Leverage Points for Sustainability Transitions

Key leverage points and main necessary changes to facilitate and enable ST identified by the initiative are:

- **Policy**: reallocation of subsidies according to sustainability criteria, regulation of land ownership that ensures farmland remain in agricultural use;
- **Education**: spreading knowledge, awareness, and values to (future) farmers and consumers;
- **Networks**: relationships/contacts may help with land, financing; bringing in support of the local community and competences of the members;
- **Communication**: between farms and neighbourhood, but also for internal cohesion.

3.3.3. Case Study 2: Urban Garden GrüneBeete

The former student project has about 15 active members. However, the number of participants grows and varies during irregular gardening meetings. The initiative combines sustainable urban gardening with creative self-realisation and a social meeting place. It has a designated gardening spot on the grounds of the MUAS where it works with several mobile beds, a greenhouse and insect hotels. While most of its members are students, the garden is open to everyone. Most stages of the food value chain are touched in some way, and the initiative has been running relatively in a stable way since its founding in 2014, even though there has been internal restructuring.
Urban Gardening as Radical Niche

Stierand [1] defines urban gardening as the use of land in areas of conurbation for food production primarily for personal use, and they are tied to urban social life and the city’s ecological and economic cycles. Communal gardens such as GrüneBeete form a niche that is rapidly growing, with 651 listed in Germany in the online network of “anstiftung” in July 2019. The initiative gives its members plenty of scope in designing and using the garden. Decisions are made as a group. As with Entrup 119, the community aspect and spatial proximity create trust and with it, relatedness. There is room for exchange regarding experiences, knowledge, and cultural aspects, and there are also opportunities to integrate knowledge from the outside (i.e., through workshops or literature). Unconventional gardening methods can be tried out (e.g., permaculture) as well as activities such as beekeeping or building new structures (e.g., mobile patches). The initiative therefore presents an alternative to the outsourced, industrial food production in cities and offers building a connection to nature. It thereby challenges the underlying paradigm of the regime, which, according to Göpel [28] classifies it as “radical”.

Social Relations and Practices

For most citizens, routine social practices regarding food entail going to the supermarket and buying food that has been produced and processed somewhere out of sight by an anonymous source. GrüneBeete challenges routines and predominant social practices by bringing food-oriented gardening back into the minds of citizens. In its range, the initiative reinforces the shift in lifestyle and consumption practices towards more awareness and eco-friendly behaviour by offering an alternative. As with CSA, know-how is needed for successful urban gardening. Therefore, the initiative both seeks to incorporate hands-on experiences with food production into formal education and puts great emphasis on knowledge transfer, both between members and with regard to civil society, especially school children and students. Members learn from each other, from relevant literature that is shared between members, or from seminars and workshops with experts. They have to form a functioning network that shares tasks and responsibilities to tend the garden. Furthermore, the interviewees reported having a different view on their own balconies and gardens as well as their local flora, and they have acquired new practices in this context from their commitment in the garden.

Multi-Level Interactions: Linkage and Breakthrough

Since the garden is located on university grounds and embedded in the Studium Generale programme of the MUAS, the connection to local institutions of (tertiary) education is a given (e.g., seminars on biodiversity for students). While a German urban gardening network does exist, it has not been incorporated into wider regime rules; thus, institutional anchoring has not happened so far. By incorporating in their Articles of Association a focus on organic farming techniques as one main method to reach their aims, the garden acts within the norms of the existing regime and also responds to the trend of greater environmental awareness. It anchors into the regime primarily through network anchoring: great emphasis is put on collaborations. While the garden benefits from the support it receives from the city of Münster, it is at the same time a source of information and a potential partner for questions that arise in the context of other gardening projects, creating interdependencies. Technological anchoring plays a comparatively smaller role, e.g., by promoting practices that enable people in the city to participate in food production. As with Entrup, rather than anchoring, the initiative offers an alternative to (parts of) the existing regime. The initiative participates in political opinion forming on a very small scale; for instance, members of the initiative get together to participate in demonstrations such as ‘Wir haben es satt’ (‘We are fed up’, a yearly demonstration in Berlin for more sustainable farming).
Sustainability Dimensions

As the initiative does not have any economic aims, it mostly operates in the social and ecological sustainability dimensions and combines the two by creating a meeting place and location for social learning that focuses on sustainable gardening and facilitating self-supply. As can be seen in Table 5, many of the dimensions are touched by the initiative, implying a certain transformative potential towards an SFS.

| Environmental Sustainability | Economic Sustainability | Social Sustainability |
|------------------------------|-------------------------|----------------------|
| - Ecological farming methods: ecological seed, no pesticides, promotion of biodiversity and old cultivars | - Partial self-sufficiency | - Shared responsibilities and democratic decisions |
| - Circular value production minimising resource use and negative output | - Awareness of the value of food potentially increasing the willingness to pay higher prices | - Access to a garden for all citizens (inclusion) |
| - Promotion of biodiversity | - Appreciation of regional produce generating regional value | - Culture of participation → empowerment and self-efficacy |

Table 5. GrüneBeete’s effects on different sustainability dimensions.

Development Path

If the current developments continue, food security in German cities will be threatened. However, urban gardening as a niche innovation will not be able to feed a city if all else fails [1]. Still, it does contribute to food production and access in the city. With this constellation in mind and urban gardening as a symbiotic niche, “the demonstration of viable alternatives may change perceptions of regime insiders and lead to reorientations of (innovation) activities” (Geels and Schot [33], p. 406; cf. Transformation path P1), potentially creating new regimes through cumulative adjustments. Already, parallel to the bottom-up change aspirations by grassroots movements, local food system plans and policies are being developed “as parts of national and municipality efforts towards sustainable development” [2] (p. 135). Regime rules might remain unchanged for now, but the adoption of a niche innovation could also trigger further adjustments within the regime and the integration of further niche innovations, resulting in the reconfiguration pathway [33]. According to one member of Grüne Beete, this regime change based on an interplay and adaption of several different sustainable niche innovations is a potential trajectory.

Scaling up/out

The initiative itself is rather small, with only about 15 (varying) active members per gardening session. However, the scope widens through activities such as university seminars or collaborations with other gardens. There have been enquiries for cooperation by the city of Münster for the implementation of school gardens, so there is potential for scaling up and spreading the concept. There are existing networks of urban gardening projects in Germany (cf. anstiftung [51]) and worldwide [3], and local authorities often prove to be supportive of them. Barriers for urban gardening include lack of financial support, permanent personnel, professionalisation as well as access to land [52]. While the continuance of, e.g., allotment gardens, which are institutionalised, have proven to be long lasting, it is not yet clear whether the same holds true for less formalised collective garden projects [3]. They are, however, seen as important building blocks for urban transformation [3]. Focussing on a single local project might not show huge direct results with respect to ST, but it is important to keep in mind that values, beliefs and practices developed in this context might spill over into other areas. A study by Forsyth et al. [53] revealed that both a sense of community and a localised (rather than only regional) sense of identity increased environmental engagement in individuals, indicating that while a spread of the concept is desirable, it helps an initiative eliciting environmental-friendly behaviour.
from their members if it is rooted locally. This is the case for GrüneBeete e.V., as well as many other urban gardening projects, which act autonomously while cultivating contacts within a greater network, which might well have helped the urban gardening movement grow successfully over the past few years.

Leverage Points for Sustainability Transitions

In the context of GrüneBeete as an urban gardening initiative, key leverage points identified are:

- **Knowledge/awareness**: bringing consumers closer to the production of their food, raising awareness for how much time and work flow into it, thereby increasing appreciation; necessity to integrate this into formal education.
- **Networks**: partnerships and collaborations are vital for the initiative and play a huge role in spreading the idea, e.g., with the city of Münster and its universities; networking with other urban gardening/farming projects to spread the idea and facilitate research; with a food policy council in Münster coming up, there will be another way to expand and strengthen the network between different actors of the food sector in and around Münster.

3.4. Discussion and Outlook

Worldviews and human relation to nature can be identified as the root causes of current unsustainability [38]. These are problems rooted in the internal structures of a complex system [28]. Food can show new forms of living and working together, as well as of governance and policy [1]. The grassroots pioneers’ goals and ideas deviate from and challenge the ‘Homo economicus’ logic of mainstream economics and ideological foundation of the ‘consumer society’ that still adheres to a narrative in which more consumption equals a better quality of life [27,40]. Most initiatives focus on a single topic on the sustainable development agenda, for instance meat consumption or food waste. This allows them to remain capable of acting despite the complexity of the interlinked future challenges and facilitates communication of the initiative’s intention. For grasping the complex global social and ecological problems, sensual experiences are needed rather than purely theoretical explanations [27]. The urban agriculture initiatives GrüneBeete and Entrup provide practical experiences. They foster and re-establish the connection between people and nature, and they create ecological experiences and memories in urban citizens that are fundamental to environmental sustainability [54]. However, due to structural constraints, intrapersonal value conflicts and routines, sensitisation does not necessarily lead to sustainable behaviour change.

For imagining and building a sustainable, desirable future, simple, compelling narratives based on values can motivate substantial change. By asking “What if the grassroots initiatives’ future visions, plans and proposals were realised?”, alternative development paths and their governance unfold, and their transition potential can be estimated [17,26,29,55–57]. Each initiative provides learning opportunities for building robust transitions and proof to policy-makers that alternatives are feasible [39,58]. Furthermore, the initiatives foster a sense of belonging [59]. They overlap in their search for new socio-economic practices and relationships that are based on trust, reciprocity, collaboration, autonomy, and true democracy. Thereby, they withdraw from the logic of capital accumulation, competition, and dominance over nature [60,61].

A project has ultimate transition potential when it contributes to the collective, systemic power of social movements. Hence, it is necessary to look beyond regional boundaries [26]. In contrast to commercial agriculture in or at the edge of cities, the urban agriculture movement is relatively young and has diverse roots, the idea being initiated and spread by citizens, and network and support structures arising in civil society. Policy and research only took up the societal phenomenon after its emergence. Community, rooftop and vertical gardens as well as edible parks are popping up in all major European cities, and they are prominently present in the media, activism, and academia. Already
today, urban agriculture is an integral part of the food supply and income of millions of urban dwellers around the world [1,3,39,62–64]. Anstiftung [51] lists over 800 urban gardens in Germany alone, one of which is GrüneBeete. CSA possibly shows higher scalability potential than urban gardening as also peri-urban farms can adopt the concept. All initiatives, particularly SFY Münster and ‘Münster isst veggie’, reach more than their members through activities such as public events. The mapped initiatives have not yet initiated a regime shift. For that, they would have to cluster outside the established regime, forming a niche-regime [12,26]. Urban agriculture (including CSA, urban gardening, and farmers’ markets) can potentially form a niche-regime. SFY Münster finds itself in between, networking the different actors, whereas both Foodsharing and Münster isst veggie are directly linked to the regime, seeking to change existing structures.

According to Randelli and Rocchi [65], a group or community of any size is both more efficient and effective than individuals who act in isolation. The initiatives are collective products of the participants involved; the most important resources are the members [44,59]. As long as the regime is still stable, all initiatives are important for eliciting irritations in the ‘normal’ way of doing things. The current COVID-19 crisis has opened a window of opportunity that might facilitate change. At this point, it is crucial not to return back to ‘normal’. If a critical mass of alternatives is reached (i.e., enough citizens participating), over time, and in conjunction with landscape pressure, the initiatives might contribute to changing the structures and ‘rules of the game’, thereby inducing change in the overall system [38]. Their true potential can be realised by synthesising sustainability and social economy approaches and objectives as both revolve around caring, collectiveness, responsibility, and stewardship, which, in turn, depends on effective linking to other sectoral initiatives that focus on community and societal change [66]. With their focus on food production and social practices, both initiatives analysed face very similar conditions and challenges regarding landscape trends and existing regimes, and as radical niches, both challenge the underlying paradigm of the regime. Both initiatives challenge dominant social practices, especially with regard to the production, consumption, and valuation of food. While the CSA members need to (re-)learn how prepare their food with only regional and seasonal produce, the community garden focuses even more on personal experiences with nature and food production in order to re-establish the connection between city and land. Both initiatives seek to re-integrate farming and food production into urban structures. Their focus lies on network anchoring: Entrup seeks to integrate the local community into all farm operations while also making connections with landscape trends, e.g., globalisation versus regionalisation or growing environmental awareness. The same holds true for GrüneBeete, albeit on a smaller scale. The initiatives offer alternatives to the way food is currently produced as well as to consumers’ relationship with it. However, as a farm business, Entrup 119 has to deal with the economic challenges of the food system and interact with different regime actors to a greater extent than GrüneBeete.

The members of GrüneBeete are aware that urban gardening cannot take over urban food production in case of a crisis in the current regime. They rather see community gardens as part of a bigger transformation and aim to inspire others to build their own communal gardens. Entrup creates a viable alternative economic model and is able to feed part of the urban population. However, like GrüneBeete, its aim is not to grow but to offer inspiration and to spread the idea. Both initiatives point out difficulties in terms of finding suitable land. Thus, it is likely that many other contributions will be needed for successful transitions [67]. Other change agents should be included in transition studies, and the prevailing regime should be analysed as well. Organisations, for instance, play a key role in translating practices and ideas through facilitating dialogue, learning and exchange, as well as through coordinating and linking niche actors [48]. Wilson [68] concludes that combining state and grassroots-led approaches appears to be the best solution, with policy assisting the guidance of individual actions within agreed-upon transition corridors. Through social exchange, practice in turn offers multi- and transdisciplinary debates and feedback [12].
4. Conclusions

This paper aims at unravelling the role of civil society in the form of grassroots initiatives as the ‘third force’ beyond and across state and market in sustainable development, which is able to bypass the path dependencies and lock-ins that hinder current systems from undergoing radical change. It sets out to map the foodshed of Münster and to analyse the most promising initiatives in more depth by means of two case studies. In doing so, it drew on the relatively new research field of ST, important strands of which are the MLP as central framework, the social practices approach, and innovation systems literature.

The initiatives analysed are transition pioneers in that they already gathered practical experiences on how to do things differently, which is in accordance with their knowledge and values. They make use of multifarious grassroots innovations, from organic and biodynamic practices, urban and community-supported agriculture, to manifold new economies and forms of social organisation. Working on ST on the ‘mini-level’ of the individual and micro-level of the initiative, they change society from the bottom up through awareness-raising and building bridges between urban and rural, production and consumption, nature and culture, and people and places. Thereby, the grassroots initiatives lay the groundwork for structural change. They can be seen as paradigmatic role models for the democratic, inclusive, and collective search, experimentation and learning processes that are at the heart of ST, calling for a new transition literacy. Among topics that should be central are food waste, as it undermines the environmental, social and economic sustainability of territorial food systems. Scaling the activities and experiences of grassroots initiatives such as social learning and empowerment will multiply the opportunities for citizens to shape spaces and systems together. Next to an array of creative solutions, this may lead to individual, communal, and societal resilience in a world in transition.

Accordingly, ST need both a systems view, which is appropriate for dealing with systemic problems, and regionally specific diversity. The breadth of initiatives with different goals, possibilities to get active, and forms of organisation as well as their spontaneity and openness make them compatible with, and interesting for a diversity of life plans and population groups. For broader adoption, culture must change, and values such as solidarity need to be scaled up rather than individual initiatives that, when growing out of their niches, risk losing their transformative potential. Both producers and consumers need to be enabled to become active food citizens and form mutually empowering alliances. Rather than co-opting their innovations, cities should consult the grassroots initiatives and establish participatory processes, learning from and with them. (Urban) agriculture may function as an entry point, and grassroots initiatives may function as signposts. Throughout Europe, farmland is lost to urban sprawl and other infrastructure projects. Environmental pressure on farmland is increasing, as are financial pressures on farmers due to the scarcity of land and land speculation. The COVID-19 pandemic has further increased environmental awareness, highlighting the importance of our relationship with nature and our need for nature-positive FS. Many of the initiatives are active in the field of education and/or culture. Still more important than promoting sustainable livelihoods for alternative food producers is their role in consumers becoming food literate, politically active ‘food citizens’.

However, overarching policy levels need to change as well. The replication of sustainability initiatives at larger scales and in all sectors calls for specific innovation policies that aim at empowering citizens and focus on context-specific, radical, transformative innovations as opposed to the dominant governance logics of the state and markets. The new understanding of governance as a continuous search process (in the sense of Transition Management) can pave the way to polycentric, collective, and transformative governance of territorial food systems.

While the present research was performed before the COVID-19 pandemic, it is crucial to take into consideration the lessons learned because of /thanks to the pandemic and to implement them at the local and territorial level. In particular, nowadays, all ST undertakings and initiatives in the food arena should take into account the COVID-19 pandemic, and other similar pandemics, and for that, they should also focus on improving the resilience.
of the territorial food systems and their preparedness to shocks and crises. In this regard, sustainability and resilience should be considered as complementary and strongly linked concepts, and their functional linkages should be operationalised in territorial food policies.

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**References**

1. Stierand, P. Speiseraume: Die Ernährungswende Beginnt in Der Stadt; Oekom Verlag: Munich, Germany, 2014.
2. Olsson, E.G.A. Urban food systems as vehicles for sustainability transitions. *Bull. Geogr. Socio-Econ. Ser.* 2018, 40, 133–144. [CrossRef]
3. German Advisory Council on Global Change World in Transition—A Social Contract for Sustainability: Flagship Report. Available online: https://www.wbgu.de/fileadmin/user_upload/wbgu/publikationen/hauptgutachten/hg2011/pdf/wbgu_jg2011_en.pdf (accessed on 10 October 2021).
4. Erickson, P.J. Conceptualizing food systems for global environmental change research. *Glob. Environ. Chang.* 2008, 18, 234–245. [CrossRef]
5. Geels, F.W. Processes and patterns in transitions and system innovations: Refining the co-evolutionary multi-level perspective. *Technol. Forecast. Soc. Chang.* 2005, 72, 681–696. [CrossRef]
6. FAO. Sustainable Food Systems: Concept and Framework; FAO: Rome, Italy, 2018.
7. Zasada, I.; Schmutz, U.; Wascher, D.; Kneafsey, M.; Corsi, S.; Mazzocchi, C.; Monaco, F.; Boyce, P.; Doernberg, A.; Sali, G.; et al. Food beyond the city—Analysing foodsheds and self-sufficiency for different food system scenarios in European metropolitan regions. *City Cult. Soc.* 2019, 16, 25–35. [CrossRef]
8. Unruh, G.C. Understanding carbon lock-in. *Energy Policy* 2000, 28, 817–830. [CrossRef]
9. Markard, J.; Raven, R.; Truffer, B. Sustainability transitions: An emerging field of research and its prospects. *Res. Policy* 2012, 41, 955–967. [CrossRef]
10. Meynard, J.-M.; Jeuffroy, M.-H.; Le Bail, M.; Lefèvre, A.; Magrini, M.-B.; Michon, C. Designing coupled innovations for the sustainability transition of agrifood systems. *Agric. Syst.* 2017, 157, 330–339. [CrossRef]
11. Avelino, F.; Rotmans, J. Power in Transition: An Interdisciplinary Framework to Study Power in Relation to Structural Change. *Eur. J. Soc. Theory* 2009, 12, 543–569. [CrossRef]
12. Loorbach, D.; Frantzeskaki, N.; Avelino, F. Sustainability Transitions Research: Transforming Science and Practice for Societal Change. *Annu. Rev. Environ. Resour.* 2017, 42, 599–626. [CrossRef]
13. STRN. A Mission Statement and Research Agenda for the Sustainability Transitions Research Network. Available online: http://www.transitionsnetwork.org/files/STRN_research_agenda_20_August_2010%282%29.pdf (accessed on 10 February 2017).
14. Wittmayer, J.M.; Avelino, F.; van Steenbergen, F.; Loorbach, D. Actor roles in transition: Insights from sociological perspectives. *Environ. Innov. Soc. Transit.* 2017, 24, 45–56. [CrossRef]
15. Köhler, J.; Geels, F.W.; Kern, F.; Markard, J.; Onsongo, E.; Wieczorek, A.; Alkemade, F.; Avelino, F.; Bergek, A.; Boons, F.; et al. An agenda for sustainability transitions research: State of the art and future directions. *Environ. Innov. Soc. Transit.* 2019, 31, 1–32. [CrossRef]
16. Seyfang, G.; Smith, A. Grassroots innovations for sustainable development: Towards a new research and policy agenda. *Environ. Politics* 2007, 16, 584–603. [CrossRef]
17. El Bilali, H.; Hauser, M.; Wurzinger, M.; Probst, L. Alternative food systems: Using space, time, integration and rules as narratives for sustainability transitions. In Proceedings of the Tropentag 2017, Bonn, Germany, 20–22 September 2017.
18. Turnheim, B.; Berkhout, F.; Geels, F.; Hof, A.; McMeekin, A.; Nykvist, B.; van Vuuren, D. Evaluating sustainability transitions pathways: Bridging analytical approaches to address governance challenges. *Glob. Environ. Chang.* 2015, 35, 239–253. [CrossRef]
