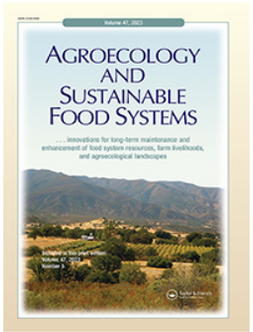

Agroecology and Sustainable Food Systems

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/wjsa21

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To cite this article: Eliane Bakker, Jan Hassink & Kees van Veluw (2023) The 'inner' dimension of Dutch farmers' trajectories of change: drivers, triggers and turning points for sustained agroecological practices, Agroecology and Sustainable Food Systems, 47:5, 687-717, DOI: 10.1080/21683565.2023.2180563

To link to this article: https://doi.org/10.1080/21683565.2023.2180563

Published online: 28 Feb 2023.

AGROECOLOGY AND SUSTAINABLE FOOD SYSTEMS
2023, VOL. 47, NO. 5, 687–717
https://doi.org/10.1080/21683565.2023.2180563

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The 'inner' dimension of Dutch farmers' trajectories of change: drivers, triggers and turning points for sustained agroecological practices

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ABSTRACT

Transformation to sustainable agriculture in the Netherlands is increasingly called for. Agroecology is acknowledged as a sustainable – potentially transformative – alternative for conventional methods of agriculture. However, few farmers adopt agroecological practices. Recent literature suggests failure to achieve sustained and transformational change may be due to neglectance of personal, nonmaterial aspects of such processes, also referred to as "inner" dimensions of sustainability. Aiming for empirical underpinning, individual transition pathways of nine agroecological farmers were explored, and processes of change were analyzed using a conceptual framework of "zones of friction and traction" across three interconnected and embedded spheres of transformation: the personal, the practical and the political. The chosen framework allows for seeing the role of the personal aspects of transformation, without losing sight of pressures and influences from the "outside." Identification of zones of friction and traction revealed where and why transformation was happening, as well as the drivers behind farmers' choice and passion for agroecology. We argue that focus on the "inner" dimension or personal sphere is foundational to sustained transformational change in the practical and political spheres, i.e. the outside world. The presented findings have implications for strategies targeting envisioned transition toward a sustainable food system.

KEYWORDS

Transformational learning; agroecology; inner sustainability; values; transitions

Introduction

In the context of environmental crises and climate change, transitioning to a more sustainable food system is increasingly urgent (Altieri 1998; FAO 2014; Gliessman 2014; IPBES 2019; Loorbach 2007). Transformation or transition (here used interchangeably) is a concept that currently appears in many policy documents and scientific debates in the context of today's climate and environmental challenges (O'brien and Sygna 2013). Action for change in agriculture is called for in the European political debate, perhaps most clearly seen in the proposal for the post-2020 Common Agricultural Policy (CAP) (European Commission 2017). Also in the Netherlands, pressing problems in agriculture have moved to the forefront of political discussions. Modern agriculture, the

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predominant mode of production in the Netherlands, has led to homogenization and simplification of the landscape resulting in biodiversity loss, water pollution and contributes to climate change (PBL 2020; Tscharntke et al. 2005). Once more stating that the food production system in the Netherlands is untenable, in 2018 the Dutch Ministry for Agriculture, Nature and Food Quality (LNV) has presented a new vision that aims for a more sustainable food system (LNV 2018). However, the envisioned transition to "circular agriculture" has barely translated into concrete or effective policy measures yet. Existing measures are designed to fit into conventional farm management, thereby contributing little to the needed transition in agriculture (PBL 2020). How to support such transitions and overcome existing lock-ins remains a question that has not been addressed successfully (HLPE 2019).

"Agroecology" has emerged as an alternative approach and a promising paradigm that can address the diverse challenges and contribute to a just transition (Anderson et al. 2019; Gliessman 2014). It aims to apply ecological concepts and principles to the design and management of sustainable agroecosystems (Altieri, 2014, Gliessman 2018a). Starting from the 1960s, when the detrimental effects of modern agriculture on the environment became clear, agroecology, then already a subject of scientific research, gained popularity as a sustainable farming practice and a social movement. Predominantly originating in the America's, in Europe and the Netherlands the agroecological movement has only substantiated until recently, with the exception of a few early pioneers (Wezel et al. 2009).

Because agroecology is based on principles rather than a set of rules, and is organized bottom-up, it takes different shapes in different contexts. Therefore, the concept is applicable to a variety of alternative farming systems like permaculture, regenerative agriculture, and some forms of organic agriculture. As of yet, there has been no consensus on a single definition, but agroecological farmers who have connected internationally through organizations such as La Via Campesina, have formulated the principles according to which they farm, first of all stating that "agroecology is a way of life and the language of Nature" (Nyéléni International Forum for Agroecology 2015). Recognizing deep relatedness between all beings, respecting different contexts that ask for different practices, and defending rights of peasants, fisherfolk, pastoralists and other rural workers – with the goal to retain food security and food autonomy – is at the core of agroecology. Being adaptive, sensitive to different contexts and cultures, and organized bottom-up, agroecology is promoted as promising means to cope with existing and anticipated climate and food crises (IPCC, 2022), with support of, and within the boundaries of the ecosystem in a fair and equitable way (HLPE 2019).

Our contribution focusses on the transformation processes of individual farmers. As proposed by De Haan and Rotmans (2018), "transformative

change is the consequence of deliberate, or even strategic actions of specific types of *value*-driven actors," who connect in alliances. In the context of sustainability transformations in the food system, the farmer is a key actor, acting as a translator of societal, environmental, and economic demands into daily practices and thereby strongly influencing outcomes for large parts of the landscape and acting as a potential co-carrier of transformation. As such, the envisaged broad transition for the wider landscape and Dutch food system as stated in various political documents consists in part of individual transition trajectories. Saying that, we don't want to put full responsibility to the individual farmers, because there are many influential stakeholders who push-back from moving to more agroecology oriented systems as they are locked in to conventional industrial agriculture (Gliessman 2018b).

Grin, Rotmans, and Schot (2010), and Loorbach (2007) have elaborated on other preconditions for transformative change related to the dominant regime and dynamics of niche development and emergence. The latest addition to this body of research is the emphasis on the importance of individual actors (De Haan and Rotmans 2018). Trajectories or life paths are shaped by choices, which are grounded in personal and cultural values, either consciously or unconsciously held (Horlings 2015a). Although situational contexts and pressures from "outside" also influence our choices (Mills et al. 2017), it is argued that sustained commitment to environmental (or perhaps any type of) practices is motivated by one's most deeply held values (Horlings 2015a). Thus, long-term behavioral change comes from the "inside out" (*ibid.*). This puts individuals' trajectories and experiences in a new light, as they may offer a better understanding of why, how, and when transformations toward sustainable behavior happen, and what values, drivers and motivations are at the heart of this process (Feola et al. 2015; Mills et al. 2017). This said, we are aware that agroecology has evolved as a practice a science and a social movement (Wezel et al. 2009; Gliessman, 2018a), stressing that agroecology is not a private issue of good willing farmers. It is rooted in the peasant movement and has a strong political dimension centered around agency and power issues, criticizing mainstream agri-food systems (Lopez-Garcia and Gonzalez de Molina 2021). Recent contributions to agroecology focused on the transformative power of agroecological principles to redesign alternative, more fair food system (De Schutter, 2017; Gliessman, 2014), and the scaling-out and scaling-up of agroecology (Gliessman 2018b; Gonzales de Molina and Lopez-Garcia 2021). Such food systems should strengthen local food systems and respect the multiple food cultures. This requires strategic approaches including changes in legal and regulatory frameworks (Gliessman 2018b)

At the same time, failure to take into account psychological, psychosocial and behavioral factors – or the "inner" dimension – is deemed a major limitation in successfully enacting transformations for sustainability (Hill 2014). Such dimensions are commonly overlooked in transition management,

as primarily technical, economic, political, or social dimensions are considered (De Haan and Rotmans 2018; Sherwood, Van Bommel, and Paredes 2016). Although a growing body of literature has put forward the importance of "inner sustainability" and subjective, nonmaterial aspects of transformative change (Horlings 2015b; Ives, Freeth, and Fischer 2020; O'brien 2018), empirical underpinning of the link between "inner worlds" and the transformative change for sustainability is limited (Ives, Freeth, and Fischer 2020).

With this in mind, the focus in this study is the *why* and the *how* of farmers' pursuit of agroecology in their farming system, including "outer" and "inner" dimensions. Aiming to contribute to this field empirically, we have explored the trajectories[1] of nine agroecological farmers in the Netherlands that have changed their own practices radically and aim for fundamental change in the Dutch agricultural landscape. Some of these farmers started pioneering as early as the 1980's, others have started farming very recently. We were interested to learn whether perceptions, values, worldview, but also type of obstacles experienced have changed over time. Public opinion and support through sustainability movements – e.g., increasing amount of newspaper articles, podcasts, and public lectures on agricultural crises, as well as the emergence and growth of more and more agroecology and peasant organizations and initiatives – may have changed the agricultural/sustainability "climate" since the early years of the environmental movement, possibly also impacting how farming practices develop.

The latter group of farmers that started recently includes relative many new entrants in agriculture. This is an interesting aspect to consider, given that cultural norms and values developed over time in the traditional farming community often reject "nature-inclusive" practices (Westerink et al. 2019). New entrants may not, or to a lesser extent, be affected by such cultural norms and their motivations and constraints may differ from farmers with a farming background.

Combined, the stories and experiences of these farmers with different backgrounds may offer insights into abovementioned aspects of transformation. Aiming to gain a better understanding of what motivated farmers to start agroecology and maintain practices despite the setbacks that come with pioneering, we explored what critical events and drivers underlay this strong change of course. We were interested to learn what had shaped their vision, and whether a transformation had happened on the "inside," before change materialized in practice. In addition, the objective was to explore whether starting period and background of farmers affected the transformation process. In other words, we aim to advance the transition toward a sustainable food system and gain understanding of how to overcome lock-ins of the current system by learning from agroecology pioneers.

Theoretical framework

The focus in this study is on the aspirations, personal developments or transformations of individual farmers. Transformation to sustainability can be defined as physical and/or qualitative changes in form, structure, or meaning-making, but can also be understood as a psycho-social process, involving the unleashing of human potential to commit, care for and effect change for a better life (O'brien 2012). In this definition, both "inner" and "outer" dimensions are reflected. Attempting to understand transformation in its full depth, in this study two frameworks are used, while keeping the notion of the "inner dimension of sustainability" in mind. Firstly, Gosnell, Gill, and Voyer's (2019) framework is used (see Figure 1), in which transformation is understood as interplay between zones of friction and traction across the personal, practical and political sphere (Gosnell, Gill, and Voyer 2019). This framework is helpful in revealing the relation between drivers, constraints, and motivations that propel change. The "inner" dimension is accounted for without losing sight of the "outer" dimensions by distinguishing between the personal, practical and political sphere of transformation. This makes it

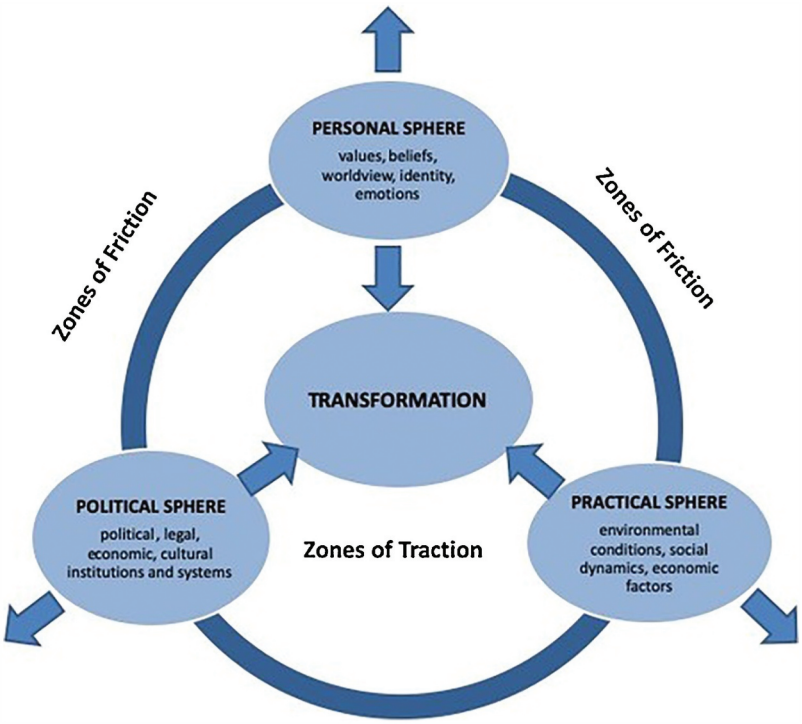

Figure 1. The three spheres of transformation, adopted from Gosnell, Gill, and Voyer's (2019). Zones of friction are disabling and move the farmer away from transformation to agroecology, whereas zones of traction are enabling and bring the farmer closer to transformation. The three spheres are not separated by clearly distinct borders but are interrelated and embedded.

a useful tool to organize responses from the interviewees. Secondly, Sutherland et al. (2012) notion of "trigger-events" is used to highlight important events in the transition process. Because triggers-events cause an irreversible change in mentality after a series of "disturbances," it has similarities to the term "tipping-points" in the field of ecology. These terms are used interchangeable in the results section.

Gosnell, Gill, and Voyer's (2019) combine Head et al. (2013) notion of "zones of friction and traction" and O'brien and Sygna's (2013) conception of three interacting and embedded spheres of transformation – the personal, practical and political – into one framework (see Figure 1). "zones of friction and traction" are described as forces that either counteract or propel transformation for sustainability. "Friction" is the pathway of resistance, either leading to more sustainable outcomes, or possibly to the opposite. "Traction" is where sustainable outcomes are facilitated. They can be seen as moments of reflection, or disturbance of routines, in which space is opened up to re-assess or change routines consistent with new circumstances. The two zones interact with each other (friction can also be a cause for traction, when feeling motivated to overcome a problem) and determine the direction of the farm trajectory. To understand how, why, and where transformations take place, it is necessary to consider friction and traction across three spheres: the practical, the political and the personal. In identifying these, the role of the personal or "inner" dimension is exposed.

The practical sphere – the "outcome" sphere – includes behaviors, technical solutions, material objects, and practices. Importantly, this is also where aims and goals are accomplished (or not). Outcomes in the practical sphere are shaped by (but also shape) the constraints and possibilities of larger systems and structures they are embedded in, i.e., the political sphere. In that sense, there are no clear boundaries between the practical sphere and the others. Examples of friction in the practical sphere are "lack of ecological knowledge" or "economic risk." Traction might be "improved soil," or "appreciation by peers." The political sphere is collective term for political, legal, cultural, and economic systems and structures, including power relations, conflicts and resistance. Zones of friction in this sphere might be "agro-industry lobby," or "lack of political support." Examples of traction are "supporting networks," or "growing interest from research community." The personal sphere encompasses individual and collective beliefs, values, norms and worldviews that shape how the systems and structures of the political sphere are viewed. This sphere is where discourses and paradigms take shape (but is always in interaction with the practical and the political). Examples of friction are "fear of change" or "pressure to conform to cultural norms." Traction could be "curiosity about other approaches to farming," or "enthusiasm about new ideas."

This framework describes general dynamics involved in decision-making and behavior, but is non-conclusive and nonspecific: it leaves room for a plurality of pathways and endpoints. As such, it may help explaining transformational change toward agroecological practices by identifying underlying mechanisms. In addition to this framework, we use the notion of "trigger-events," described as the culmination of events that leads to the realization that a major change needs to be made (Sutherland et al. 2012), to convey the importance of certain events. Friction and traction rather describe processes and direction of change but may not capture the importance of inner dimensions sufficiently. Identifying trigger-events and values that underpin them (Horlings 2015a) may help to come closer to the core of transformative change.

Methods

Semi structured in-depth interviews (Zhang and Wildemuth 2009) were conducted with nine agroecological farmers in the Netherlands. Prior to the interviews the farmers were informed about the purpose of the study and the research questions. Farmers were selected through purposive sampling (Bernard 2017) based on two selection criteria. Firstly, participants had to be committed practitioners of agroecology[2] and member of the federation of agroecological farmers. Secondly, the farmers were selected to cover a broad range of starting dates of agroecology. The earliest pioneer started his own farm in 1982, whereas the most recent entrant to agroecology started in 2016 (see Table 1 for an overview of the farmers and background information). A broad variety of farm typologies exists among the interviewees, with large differences in farm size, type and number of different activities, and (economic) exchange systems. Four of the participants were born into a farmer family and made the transition to agroecology later in life. The other five did not have a background in farming.

Family farm, sometimes corresponds with conversion to organic or biodynamic agriculture. *Here, CSA is short for Community Supported Agriculture.

The interviews were conducted in an informal, conversational manner, taking approximately 1–2 hours. The purpose was to get an image of the development of farm (outer dimensions) and farmer (inner dimensions) over time, asking about the current state of the farm, how it all started, what happened in between, and future aspirations. To get an understanding of what inspired the interviewees to maintain the path of agroecology (pioneering comes with resistance), questions about hurdles and motivations in the transition process and later in sustained practices were asked.

The interviews were analyzed according to "content analysis" as described by Elo and Kyngäs (2008). The interviews were transcribed in full, after which the interviews were read several times. Color-coding for the categories "drivers," 'constraints, "motivations" and "trigger-events" was done. Within these categories

Table 1. Overview of farmers, type of farm and different activities, farm size, background and starting year. The starting year relates to start with agroecological practices, which in case of taking over the.

Farmer	Farm type	Size	Background	Starting year
F1	**Mixed farm**: arable crops, cattle, horses, care, bakery, grazing nature reserves	50 ha	Farmers' son	1982
F2	**Dairy farm**, with agroforestry, other livestock	22 ha	Farmers' son	1996: first farm 2017: second farm
F3	**Dairy farm**, with vegetable field, other livestock, education, care farm	50 ha	Farmers' son	1996
F4	**CSA* vegetable farm**, tea/lunch garden, care farm, education	1 ha	First generation farmer	1999
F5	**Arable farm**, with few cattle, education	85 ha	First generation farmer	2000: first farm 2019: second farm
F6	**Arable farm**, education	84 ha	Farmers' son	2002
F7	**CSA* vegetable farm**	1 ha	First generation farmer	2005
F8	**CSA* vegetable farm**, education, organization agroecological movement	1.2 ha	First generation farmer	2014
F9	**CSA* vegetable farm**, education	0.6 ha	First generation farmer	2016

the most illustrative quotes (translated by the author who conducted the interview) were identified and used to highlight important themes, presented in the results section. This section inevitably leaves out a large part of each individual's story, but aims to give an idea of general sentiments. To provide a more comprehensive overview, responses were organized according to abovementioned framework of Gosnell, Gill, and Voyer's (2019).

Results

All interviewed farmers had a different story about how they came to practice agroecology. Some had grown up on a farm, knew from an early age they would become farmers and decided to convert to another way of farming later on. Others decided to become a farmer after their study, or to make a career switch at later age. Each farmer's pathway is unique, but they all aim for a similar goal: creating a better future by farming in a more holistic way. Although each story has seen many hurdles, the focus here will be on the drivers and motivations, since those are crucial in deciding for change. First the story tells how and why these individuals came to the point of starting agroecology. Then it continues to describe critical key moments of insight. The final part of the story recounts on how and why they chose to maintain this path. At the end of each section a brief summary of important factors (in terms of friction and traction) in the trajectory of change is given. A complete overview of friction and traction across the three spheres is provided at the end of this chapter (Table 2).

Table 2. Overview of zones of friction and traction as described in results. This table is complemented with additional zones of friction and traction mentioned in the interviews.

		Friction	Traction
Personal sphere 		• 'Old' mentality • Resistance/fear to change • Unawareness of other possibilities • Lacking confidence • Pride • Cultural identity and norms • Limited mental energy • Pressure of expectations from relatives and colleagues	• Biophilic values • Emotions such as joy and interest about farming and nature • Worry about conventional practices and future • Environmental awareness • Trigger-events • Finding autonomy and integrity in agroecology • Fulfillment of contributing to a better world • Alignment of values and practice
↑ ↓			
Practical sphere 	Eco-logical	• Labor intensity of agroecological practices • Soil has to get used • Accepting weeds and lower yields • Ecological boundaries pose challenges	• Increased biodiversity • Diversity leads to stability • Good yields • Improved soil • Good quality of products • Enjoyments of created values • Esthetic value
	Eco-nomic	• Low income • Expensive land • Financial risk of conversion • No compensation for added ecosystem services • High production costs (or too low conventional prices) • Insufficient sales • No access to subsidies	• Some subsidies were available in the past • Good income eventually • Independence from banks • Availability of local sales points • Sufficient members/costumers • Higher (true) prices can be asked because of connection to members/costumers • Financial buffer available
	Social	• Issues within the family • Limited access to alternative practices in conventional farming community • Change towards agroecology costs time, energy and mental space • Agroecology is knowledge intensive: steep learning curve	• Inspiring examples • Optimism within alternative/organic farming community • Network: peer-to-peer knowledge exchange and self-organization • Collaboration with nature organizations • Support of relatives • Appreciation by others • Feeling of momentum for change • Discontent with current state and quality of 'organic' • Relating to food and people

(*Continued*)

Table 2. (Continued).

	Friction	Traction
↓ ↑ Political sphere 	• Political inertia • Lack of integral policies that are workable • Lobby of industry • Society capital-focused • Lack of political recognition • Minimal support and education	• Progressive scientific insights • Societal environmental awareness • Agroecological movement in NL • Political vision encourages agroecology • Availability studies etc.

Drivers and doubts: building up to a tipping point

Each farmer has a different starting point from which his or her venture toward agroecology started. Four of the interviewees had grown up on a conventional family farm helping out and knowing farm life from inside and out. These farmers have made the transition from conventional practices to organic at first, and later to more integrated, holistic practices (i.e., agroecology). The other five had had no experience at all, or some connection at a distance to agriculture originally. These people have made the transition from being no farmer to becoming a farmer as a concrete way to contribute to a better world. As soon as they had decided to become a farmer, they knew they wanted their practices to be in line with nature.

The first part of these stories is about how each person came to the realization that (s)he wanted to be an agroecological farmer. The interviewees told their accounts of insightful moments, values and beliefs that led to certain decisions. Friction and traction shaped the direction of their pathways and eventually led to agroecology. In other words, the first part of the story is about the conscious or unconscious search for a meaningful way to put values into practice.

One of those fundamental values was the appreciation of nature, life, beings, and the relatedness between them. When talking about this, many of the interviewees related this to childhood memories of being outside in and with nature.

> *"Already when I was about 4, 5, 6, years old I was always outside, already then I could enjoy nature. I have always been a morning person, because at that time you can just* feel *life, you know, of the animals, it was always quiet and calm." (F1)*

Others recounted having received bird- and plant guides, doing school projects on forests, and being taken on hikes as a child. These experiences had both sparked interest in nature and were partly prompted by already existing interest in nature. The appreciation and wonder of the outdoors sometimes related to the notions of freedom and self-expression. Some mentioned the importance of being able to live according to one's essence: plants completing their life cycle, animals performing their natural behavior, and people being able to live in integrity and freedom. These values can be seen as zones of traction in the personal sphere, as they point in the direction of holistic farming.

Love for nature and love for farming go hand in hand in the view of these farmers. Most interviewees with a farming background already knew the joy of farming, but came to appreciate it even more after learning about farming with ecological principles. First generation farmers discovered the joy of farming only later in life, and the appreciation nature had played an important role in this discovery.

> *"I initially wanted to become a forest ranger. But I didn't get accepted in Velp, at the Van Hall Larenstein. And I thought, well, then I have to do something that comes close, haha, something where I can be outside a lot. I ended up at the agricultural school. And that's when my love for farming began. And for nature – so, the combination of the two." (F5)*

All valued the versatile nature of activities on the farm, being outside, working with living beings, or in other worlds simply: "life on the farm." An illustrative example is that, for one interviewee, an important reason to remain farmer after a huge financial setback was to pass the experience he had had growing up on a farm on to his son. Positive attitudes toward life as a farmer can be seen as traction in the personal sphere.

Apart from the appeal of farming as a job of/in nature, also worries played a significant role in the trajectory toward agroecology. Farmers who were succeeding their parents on the farm had conflicting feelings about current conventional practices and their ideas of nature, health and sustainability. Often, such internal conflicts related to toxic chemicals for weed and pest control.

> *"I sat on that combine harvester and I though, damn, in the early 60's two herbicides were in use, and in the late 60's I was easily counting 18 different kinds that were used in combination or sequentially. And well, at a certain moment I thought, there has to be another way. . . . It wasn't in line with my farmer's heart." (F1)*

Also other conventional practices, such as intensive livestock farming and corresponding manure and soil management, were cause for internal conflict or sustainability concerns. One farmer (F3) had not wanted to take over his parents' farm because of this (*"although I'd always helped and participated in whatever needed to be done, I'd never had a good feeling about it"*), despite his interest in agriculture. He had not been aware of alternative options, and it was only when he learned that another way of farming was possible that he changed his mind.

New farmers mentioned worries about climate change and biodiversity, as well as the vulnerable food system and our dependency on it as an important reason to start agroecology. An important motivation was the will to in fact change something about these issues, rather than just talking about them.

> *"Well, what drives me is just that, I have three children, and I really worry about the future. . . . It's just* really *going in the wrong direction, that's how I feel about it, and it gives fulfillment to contribute to turning that tide." (F8)*

Doubts and worries can be thought of as traction in the personal sphere, whereas the detrimental effects of conventional farming practices are traction in the practical sphere.

Asking critical questions and seeking to answer them, alternative views were explored. Courses, studying, and reading up on (scientific) literature or trade journals, as well as visiting and talking to fellow critics had been important in

the development of ecological awareness. One farmer had had decades of experience as a conventional arable farmer, but had during that same time been in search for less harmful practices.

> *"I have followed the developments in organic agriculture quite closely, though I say so myself . . . and in 1990 I subscribed to Ekoland, a Dutch magazine for the organic agricultural sector. That was twelve years before we decided to convert, because I thought, well, who knows certain things in there might be interesting for me, as a conventional farmer." (F6)*

Curiosity about critical literature and information, finally resulting in increased ecological awareness, is understood as traction in the personal sphere. In the case of the farmers' sons, such inquiry was not always welcomed by family or peers and for some this led to conflict or friction in the personal and practical sphere. Developments in society on the other hand, such as the gradual establishment of organic agriculture, publications of certain books, increase in scientific attention etc., have contributed to the exploration of a different agriculture from the "outside-in," and can therefore be seen as traction in the political sphere. Also the availability of subsidies in the past and courses and education programs was mentioned as a push in the direction to a new farming system, and originates in the political sphere. At the same time, farmers expressed how minimal support from the government, science, and education has been and still is, and that there are great gains to be made in this area. Thus, although for the interviewees it has not been a critical constraint in the end, it is likely that for many others this lack is a serious constraint in the transition toward agroecology.

In summary, important zones of traction were valuation of nature and life (personal), joy and positive attitude toward farming (personal), worry about conventional farming practices and future environmental sustainability (personal and practical), curiosity about critique and alternatives (personal), and availability of study material and support (political). Zones of friction were non-availability of alternative narratives (personal, but strongly influenced by political and practical), resistance from family and farming community (personal and practical), minimal education and support for alternative agriculture (political). Interestingly, predominantly traction in the personal sphere was mentioned as important in the buildup toward a tipping point that eventually led to a system change.

The trigger-event: reaching a tipping point

As described above, the exploration of new possibilities functioned as a buildup for actual change in practice. But before the decision for (re)design of the farm was made, often one or more events occurred in which "the penny dropped." Such moments are referred to as trigger-events. Sometimes this was a more or less gradual process, for example, when new ideas of farming had not been so contradicting to previous conceptions and worldviews. One

farmer (F2) was in the process of joining his father in a partnership, but their farm was too small to provide two incomes. When he found an internship at an organic farm similar to the type, size and environment of their own farm, the decision was quickly made. Because their practices had been extensive and close to organic already, this step was a small one to take: the conversion took three months instead of two years. In a similar way, a daughter from a gardeners' family had gradually grown into the idea of farming. When she decided to be a farmer, it was no break with an old system, but rather the realization that this is a logical next step.

> *"I came to agroecology from a feeling of wonder about nature. My grandparents and my parents all had vegetable gardens . . . from being in such a garden as a child I'd always been very interested in nature and how it all worked together, so I went to study [forestry, ecology and soil science] here in Wageningen, . . . and with my background as a child of vegetable farmers, that brought me to organic agriculture . . . during my study I wanted to know what agriculture entailed, meant, what forestry involved, so in my free time I did internships to gain practical experience. And well, some of these gardens I visited, I thought, wow, this is just amazing, I want something like this." (F4)*

New farmers benefitted from not having to break with previous farming routines and could in that sense let their thoughts run freely. For them zones of friction had to do with realizing farming is an option, giving up previous work or way of life, lack of cultivation knowledge or access to land. One farmer had worked as a financial advisor in the sustainability sector. The financial crisis had made her realize how vulnerable our food system was and how dependent we are on it. Contemplating the essential things in life, she concluded the current food system needed change. Participating in agriculture felt as an active and effective way to contribute.

> *"If you think of food security, you have to produce for the whole community, not just for yourself . . . so I started that permaculture course. A fellow student who also had 2 hectares and a family was starting a self-harvest garden and that was an eye-opener for us." (F8)*

While her work changed, the essence remained the same: she had been working in sustainability all her life, but the focus had changed. This work seemed more fitting to existing problems and personal values and wishes. Similarly, a previous activist had felt the urge to *do* something and invest in something that would have impact in the long-term. After starting a vegetable garden on a small waste ground in a city neighborhood, she came into contact with permaculture. Through this, she found a more fitting form of activism in agriculture.

> *We organized workshops about living climate neutral, and there I came into contact with permaculture. I quickly started seeing the important role that agriculture plays in climate change . . . and when I began to get involved in permaculture, I thought, this all sounds very logical to me, I think this could be a solution. But calling out from the city and tell farmers*

they should do permaculture, which was something that barely existed in the Dutch farming community, seemed unfit . . . so that's where the idea arose to bring these ideas into practice. (F9)

The trigger-events in these latter two examples are strongly driven by societal issues and the wish to contribute something tangible, but also personal matters relating to meaning-making had been key to change. This is illustrated clearly in the story of one interviewee (F7) who had started farming later in life. A personal crisis related to discontent at work and more general in life had set a search for meaning and fulfillment in motion. Taking courses, seeing inspiring examples and being open to new experiences had led to a moment of insight.

"Then, in an impulse, I went along with a friend of mine who worked on a care farm, to work there for a day . . . and I recall, at a certain moment my hands went to the soil and, bam, something happened there. That was because of my inner crisis. Because I was open . . . and I knew intuitively, okay, this is my path now." (F7)

This example illustrates how the inner dimension can play a major role in transitions. Moreover, it shows how the tipping point can happen in a sudden moment. Different than the gradual change leading to the next logical step in some other cases, here, the trigger caused a break with a previous way of life. Other farmers had experienced similar a "break," be it because of change of jobs, or because of redesign of the farm or starting a new farm altogether. Sometimes, such moments came when least expecting it.

"So my daughter, this tall, 7 years old, walks into the wheat field, and she wanted to put some of the grains in her mouth, chew on it and so on, and I say, don't do that. A discussion followed: I said I had just gone through it with the spraying machine, and that's poison. And she said, so you just sprayed this field with poison and now I can't go in and eat it? I just couldn't really give a good answer to that. Then I thought, if you can't explain a seven-year-old what you are doing, you have to quit that system. So that was the trigger moment. That's *when I said: I'm going to push through. Despite my objections and doubts, and my fears, that was the real trigger." (F6)*

Interestingly, the time it took before questions changed into insight, and insight into action differed significantly between farmers (see Figure 2). Farmer F6 for example, had taken decennia to convert after his first encounter with organic (and after that, the development to radically progressive methods went quickly). In the meantime, he had "*gradually become an integrated farmer, applying a little manure, spraying a lot less, using very low dosage*", but nevertheless he had lingered with the conventional system until an important event had triggered real change. Other farmers were more quickly convinced to change practices. This difference may have to do with varying types and importance of experienced friction. There may be high or low economic risk (practical), pride

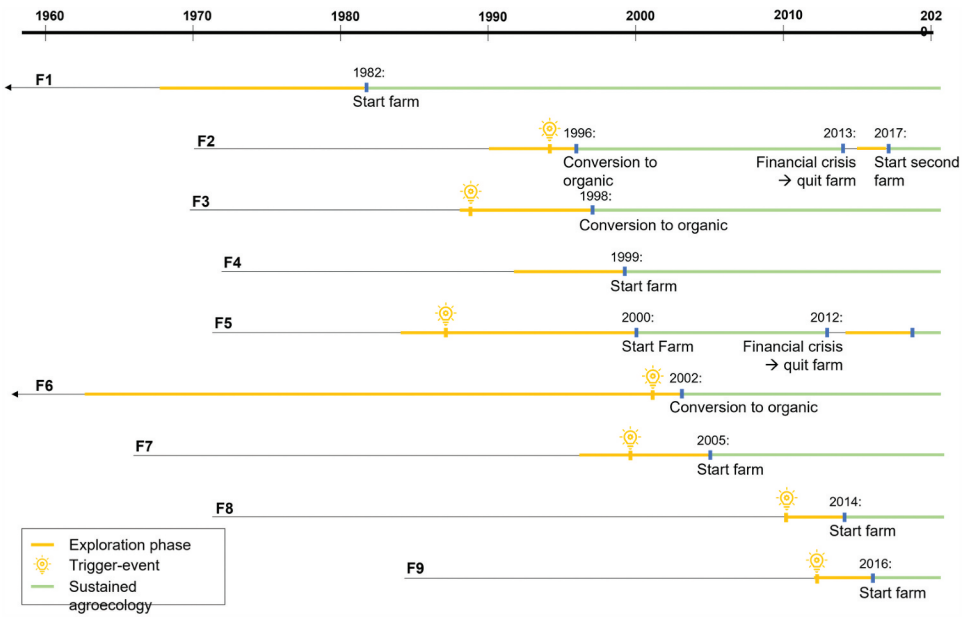

Figure 2. Overview of transition trajectory of each farmer over time. Trigger-events are indicated when explicitly mentioned by the farmer. The two publications shown at the top timeline indicate the start of an environmental movement; the financial crisis is indicated because it had major implications for the transition trajectory of at least three of the interviewees.

(personal), fear of change (personal), expectations of relatives and peers (personal), and conflicting discourses (personal, but strongly influenced by the political and practical spheres) that depend on personality and farm type. For example, the long buildup of farmer F6 may be explained by strong friction in the form of inherited discourse (“*When I’d finished school, I thought I had to kill all plants that grew in the ditches, either by spraying or mowing*”), strong local cultural norms, and high economic risk due to the scale of his farm.

In summary, all farmers embarked on an exploration that ended into a trigger-event of some kind. Trigger-events can be seen as traction (personal) in itself, but are also the result of the interplay between various zones of friction and traction. Often, friction related to crisis (e.g., financial, existential, ecological) that caused reason to reconsider current practices. Traction related to inspiring examples (e.g., colleagues, internships, literature) and helped connecting the dots. It was often the combination of both friction and traction in one or more events that made “the penny drop” and eventually led to a turning point[3] in farming practices. Such events meant radical change for some, or acceleration in a certain direction for others. In each case, it had opened the door to see how they could align values and beliefs with practice by starting agroecology.

Sustained practice and continuous change

Once the decision for a change of course was made, implementation of new practices was the next step. This meant redesign of the existing farm for some, or starting a new farm altogether for others. It involved overcoming fears, steep learning curves and practical problems on the way. Farming ecologically is knowledge intensive. Some of the interviewees started out by following a course or study, while others had a learning-by-doing approach, benefitting from others' experiences. Sometimes the first hurdle to overcome was admitting that there was still much to learn:

> *"That was pretty tough, asking colleagues for help, when you had been thinking highly of yourself as an experienced farmer, as most farmers from this area do." (F6)*

However, once the plunge is taken, perspectives may become clear and as the learning process of applying ecological principles progresses, trust may replace fear,

> *"So as a farmer you can feel threatened but at the moment that you take the plunge and convert, then the view becomes clear. Then, you are beginning to function within the boundaries of what is possible in your environment." (F8)*

For example, this farmer solved the problem of heavy clay soil, difficult to cultivate without machinery, by making berms and swales and planting perennials. Another enriched her poor sandy soil by always keeping the soil covered with a great variety of crops and plants. Whereas conventionally, weeds are unacceptable, now a little weed may be considered fine – even necessary for natural enemies – or rediscovered as a tasty addition to the menu. Such practices and skills were gained while learning how to read the ecosystem.

After conversion and accepting the steep learning curve, a relatively unstable period of continuous learning, trying, evaluating and adapting begins. New practices must be mastered and fine-tuned, while dealing with multiple pressures.

> *"Your income becomes considerably lower, the soil has to get used to it, you yourself have to get used to it, and then you also have to deal with the perception from the neighborhood, which wasn't very favorable during that time, in 2002, when we converted." (F6)*

This statement reveals friction in four areas: economic (practical and political), ecological/technical (practical), identity (personal and practical), and social/cultural (personal and political). Multiple farmers mentioned financial issues. Two main reasons where that the cost of production is too high for conventional market prices, or a lack of buyers/members. However, most farmers see a (slow) increase in financial resources that may be due to increase of consumer awareness and willingness to pay for high quality food and ecologically sound practices. Often, people become connected to the farm and the farmer

over the years (for example when self-harvesting or coming to the local/farm shop), thereby learning to look at food production in a different way. Such developments can be seen as traction in the practical sphere.

Zones of traction in the practical sphere are found in visible success or improvements such as good yields, successful pest management or improved soil. This kind of measurable success is important for maintaining confidence. Tangible results work enthusing in itself, but also to validate practices to the outside world. Often, alternative practices are opposed with ridicule, mistrust, or in some cases threats. First priority was to show the value of their farm.

> *"The goal has always been twofold: agricultural and societal. But in the beginning the agricultural goal was primary, because we had to start in the middle of nowhere and those conventional farmers all thought, well, within two years that guy will be covered in weeds and diseases and misery, he will be gone by then." (F1)*

Good results led to positive responses from others. Some had won public prizes – concrete tokens of appreciation; others had good contacts with local nature organizations or research institutes. Positive feedback from relatives, colleagues, neighbors, members or customers was described as motivating to sustain new practices.

When the primary goal of good practical results was achieved, room for the societal goal was opened up. Wanting to convey both their enthusiasm and new-gained knowledge, interviewees often put effort into sharing their experience with others.

> *"When I take [my students] here, and I show them that I don't use any chemicals, no artificial fertilizer, and I have no virus in my potatoes and 20% higher yields with strip cropping, well, they start scratching their heads." (F5)*

While food production is the core line of work, education is an important side-aspect of the farm, contributing to a broad transition in agriculture. Farmer F5 teaches at a conventional farming school, an effort to give young farmers-to-be the opportunity to learn about alternative views on agriculture. Others offer education programs, host school classes, or organize events. One farmer has recently started a project for "nature-inclusive farming" together with the provincial government, for which there turned out to be great interest from conventional farmers. The enthusiasm of both the province and the conventional farming community points to an improved reputation of nature-inclusive methods (traction in the political sphere). Sometimes education went both ways (from farmer to CSA members and vice versa) and took shape in the interaction with people involved in the farm. Processes of (mutual) learning and development was described by some as major source of traction.

> *What excites me most is seeing people change their way of thinking. New members often ask for rules for harvesting, and when I tell them they can take as much as they need, they*

are uncomfortable at first. They have to get used to the trust that is given to them, but I can see them grow into that new way of thinking . . . thinking in terms of trust. And by working in this way, I notice a transformation in myself too. Allowing involvement of the members teaches me to develop an equal relationship with them, in which we are doing this together. (F7)

This statement illustrates the ongoing change that occurs on the farm and everyone involved, and at the same time it makes clear how excitement about things – in this case joint development of the farmer, members and the garden – is motivating to continue on this path. Joy and enthusiasm related to continuous learning, exploration, experimentation, and inspiration had not only been vital to transitioning, but also generates energy needed to proceed into less explored areas. What works exciting differs for each individual. Where the abovementioned farmer was energized by development of and with people, another farmer "*got a kick*" out of going on study trips abroad to gain new knowledge on progressive farming techniques. Some have set up scientific experimental fields, sometimes in collaboration with researchers, enjoying the process of proving and improving cultivation techniques. Others teach, host courses, receive school classes, try out radically different farming systems (e.g., food or forage forests), or work on a better system for knowledge exchange and the agroecological movement on a national level. Though different aspects of agroecology were motivating to each particular farmer, they seemed to share a philosophy – to do what makes your heart beat faster:

"You have to feel for this, otherwise, you shouldn't do this at all. You know, emotion is the source of everything. Actually. Eventually. That's the real source. And if you don't feel any emotion for those things, then why would you do it? Yes, to sustain yourself, yes, but. you have got to like it, or consider it valuable, or it should make you feel warm. Right? Something that doesn't make you feel warm inside, that's deemed to fail. That's how I see it at least." (F6)

"Feeling for something" seems to be an important precondition, expressed by many of the interviewees in different words, but most clearly articulated in the statement above. This farmer stresses the importance of finding meaning and joy in the work you do, as you won't keep up any venture otherwise.

So far, the story tells of accounts of the past up to the moment of the interview. It is important to note that the farm is subject to constant change. Farmers are experimenting for new practices (e.g., agroforestry or food forests), technical innovations (becoming energy neutral), discovering ecological processes (e.g., in soil biology, nutrient cycling or plant physiology), or social processes (e.g., common farm management, self-organization, organizing knowledge exchange). Such future plans and prospects were told with enthusiasm.

In summary, after having experienced a trigger-event, friction and traction played a role in taking action for (re)design of the farm and sustaining practices. First, fear of change and pride had to be overcome (friction in the personal sphere), after which a steep learning curve began (friction in the practical sphere) while income was often low (practical), and the perception of family and peers was not always positive (personal/political). But these hurdles were faced with new-won energy and eventually traction was leading in the farm development: as ecological awareness increased, perspectives became clear (practical); as positive agronomical results were achieved (practical), and appreciation by others was expressed (personal and partly political) fear was replaced by trust. The success of their own ventures motivated farmers to share experience with others. Notably, joy and enthusiasm about experimenting, knowledge exchange and continuous learning, positive response from others and a diversity of future plans and possibilities have been important drivers for sustained agroecological practices.

An overview of zones of friction and traction throughout the transition trajectory – including buildup phase, trigger event and sustained practices – can be found in Table 2. This overview does not capture time (some zones of friction and traction are specific to a certain period of time, others remain a constant factor), but is meant to give an idea of the overall factors that drive and hinder transformation to agroecology and of the dynamics between them.

Discussion and analysis of observations

Despite political ambitions to stimulate the transition to sustainable agriculture, results are disappointing (HLPE 2019). Current measures in the form of rules, regulations and "green direct payments" have little effect and focus merely on the "outer" dimensions of sustainability. Literature suggests that working with the "inner dimension" of sustainability could forward intended transformative change toward agroecology (Gosnell, Gill, and Voyer 2019; Horlings 2015a). The personal process of transformative learning and commitment has received little attention, although an increasing body of literature highlights the importance of such "inner" dimensions and a need for empirical research (Ives, Freeth, and Fischer 2020). This study aimed to contribute to a better understanding of transformation toward agroecology by exploring Dutch farmers' trajectories of change and their underlying values and drivers.

Drivers, triggers and sustained practices discussed

The most important observations were that drivers for agroecology often included personal values related to biophilic emotions, the joy of farming,

and worries about the future; all farmers reported moments of insight or crisis that made "the penny drop," often inspired by seeing practical examples; agroecological practices were sustained through self-reinforcing positive feedback. In that, all farmers reported on similar values; for new entrants trigger-events related to a shift in focus of work whereas for farmers' sons they related to a shift in agricultural discourse. The constraints and motivations varied per person and farm type.

Drivers

When asked about the reasons to start agroecology, interviewees described a worldview that places valuation of nature, all living beings and the relatedness between them central. The fact that they mentioned it in response to this question implies it is an important value that underlies their environmental behavior. This supports previous literature that suggests (biophilic) values play a fundamental role in peoples' choices, motivations, beliefs and worldviews, and thereby in sustainability transitions (Gosnell, Gill, and Voyer 2019; Horlings 2015a). Related to this, three farmers (new entrants) told they had been active in sustainability throughout their lives and others mentioned that interest in nature originated in childhood. Previous research suggests that childhood experiences play an important role in developing "eco-affinity," "eco-awareness" and "eco-literacy" (Chawla 1999; Larson, Green and Castleberry 2011; Mitchell and Mueller 2011). Connected to such biophilic values is the notion of "sense of place," referring to peoples' feelings and ideas about a place (natural, but also, for example, a farm) and the meanings and values they attach to it. Recent literature links environmental action to sense of place and sustainable place-shaping (Grenni, Soini, and Horlings 2020). With that in mind, developing a sense of place in nature, attaching meaning to a particular natural environment, can foster pro-environmental behavior as people are inclined to protect places that are valuable to them (Manzo and Perkins 2006; Mihaylov and Perkins 2014). Further development of such ideas in research and applying insights to adult and childhood education and pedagogy may have potential to move sustainability transitions forward.

Furthermore, knowing or discovering the joy of life as a farmer has been key to maintain or start farming. Joy points to valuation of something, here on certain aspects of the work. In the context of emotional function, it may also spark thoughts and actions, and when persisted over time is may increase one's physical, intellectual and social resources through for example playfulness (Fredrickson 1998), and general emotional wellbeing. Thereby it may broaden one's perception of what is possible. A related positive emotion is interest or curiosity, sparking exploration of the topic of interest (*ibid.*). Accounts of interviewees support the idea that positive emotions and using them as guidance are important in starting a new venture.

Worry, on the other hand, is a negative emotion that functions to discern relevance and help to prioritize values. Worry about the consequences of environmental risk is described as a possible trigger for changed behavior by Pfister and Böhm (2008). Interviewees expressed worry about conventional practices and environmental crisis incited a feeling of urgency, and in combination with valuation of natural places and curiosity, it encouraged exploration. As such, emotions, both positive and negative, fulfill an important function in (moral) decision-making (*ibid.*).

Interestingly, all interviewees share similar values on the importance of nature, the interconnectedness of people and their environment and attitude toward environmental problems. They also share an attitude open to change and exploration.

Triggers

In the exploratory phase of the transitioning process, friction sometimes led to (inner) crisis or conflict, while traction sometimes led to eye-opening experiences, often effected by inspiring examples. The interplay between such zones of friction and traction culminated in trigger-events, in which suddenly perspectives arise in which practices are aligned with values. It seems that it is in this instance that interest turns into passion, and that triggers play an essential role in transformation by generating a burst of "directed energy" for future ventures. Previous research states that triggers are important in breaking out of path-dependency (Sutherland et al. 2012), characterized by an irreversible shift in mentality (Taylor 2007). Being open to critical (self-) reflection and change is an important precondition in this regard. Admitting previous mistakes or weaknesses is needed for a different "way of seeing," and ultimately for behavioral change (Mezirow 1997; Taylor 2017).

For new entrants in agriculture triggers related to change of work, refocusing preexisting interest in ecology and related issues to farming activities, whereas for farmers with a farming background, triggers related to a shift in view on conventional agriculture. Interestingly, the time it took before the exploration culminates in a trigger-event and consequent action varied considerably between farmers, ranging from 30 years to several months/years (although it is difficult to trace back when exactly the exploration started). This may have to do with different constraints each farmer faced. For example, farmers who grew up on a farm had to deal with social pressure stemming from cultural norms and notions of a "good farmer" that often does not comply with agroecology or nature-inclusive farming (Westerink et al. 2019). New farmers had no or few (emotional) ties to the conventional farming community, thereby experiencing less constraint by peer pressure, but also by internalized discourse around productivist narratives. Identifying constraints and the role they play in inhibiting transformations is an interesting topic for future research. Such information may enable educators to "induce"

epiphanies and help farmers who consider transitioning with overcoming situational, knowledge, and emotional constraints (Mezirow 1994).

Obstacles and motivations for sustained practice

In the run-up to, but also after starting agroecological practices, farmers were faced with difficulties. Among them were financial issues, issues within the family, perception by the neighborhood, knowledge intensity of practices and personal processes such as pride or lack of confidence. However, motivating aspects of agroecology were leading in decision-making in the case of all interviewees. Setbacks were viewed as less important than the advantages and prospects of agroecology, and were overcome by seeking solutions through experimenting. This illustrates a strong inner drive and commitment, an important factor for success (Hassink, Hulsink, and Grin 2016). Presence of successful entrepreneurship is not surprising in this case since the participants were selected on sustained agroecological practices. More interesting than the fact *that* these farmers are not held back by obstacles is the question of *why* this is the case.

Obstacles seem to be countered with a passionate vision acquired in buildup to agroecology and irreversibly internalized during a trigger-event. Farmers described it as seeing no other option but doing things this way: once learning to "see" differently, that shift in mentality cannot be reversed. It becomes "just the normal thing to do." One aspect then, is the irreversibility of the shift in mentality.

Another aspect is the importance of positive emotions. As proclaimed by interviewees, "emotion is the source of everything," "it's just what comes from inside" or "what feels good," stressing the importance of wholeheartedness – "setting your own course, while maintaining integrity." Joy, interest, contentment, or enthusiasm related to aspects of the work, learning new skills and knowledge, continuous experimenting or connection to others and nature also to build resources (physical, intellectual, and social) that can be drawn on later (Fredrickson 1998; Pfister and Böhm 2008 and create a feeling of trust. What the interviewees find energizing or motivating differs from person to person, with no apparent distinction between backgrounds or other characteristics.

These findings substantiate the influence of validation and appreciation (by others and by self) on practices. This implies that communities of practice, peer-to-peer knowledge exchange could foster mutual appreciation and validation, as well as improved methods and techniques, which in turn reinforce positive feedbacks. Hence, connecting to communities of likeminded people – such as in the Netherlands peasant organization "Toekomstboeren" and the "Federation of Agroecological Farmers" – can be of importance in sustaining change.

Lessons learnt and future directions

The interviews with farmers committed to agroecological practices revealed the importance of biophilic values in shaping pro-environmental worldviews and attitudes; the drive to contribute to that worldview in a positive and concrete way; the importance of emotions in generating intellectual, physical and social resources; how critical reflection and openness to change is a precondition for transformative change; and the importance of availability of study material, support and practical examples. Furthermore, we found that these pioneers determine direction through seeking internal consistency, and seem to have found it in agroecology. Also, new entrants experience different constraints in achieving agroecological practices, and trigger-events often relate to realizing they want to become a farmer. These findings show that transformation occurs throughout three spheres, of which the personal sphere appears to be foundational for sustained change on farm level.

Such insights may be considered in strategies for a sustainability transition in agriculture through education and support programs. Policies are more likely to lead to desired behavior when they are aligned with drivers and motivations of farmers (Home et al. 2014; Moon and Cocklin 2011). When motivations of farmers are better understood, policies can be aligned to them. Nevertheless, this will not automatically lead to desired outcome. Many models have been developed to describe, understand and ultimately to manage transitions. Such models predominantly draw on past examples of transformation, causing future ("purposive") transitions to be treated teleologically, anticipating the results (O'brien and Sygna 2013). Yet, transitions are difficult to manage and are only malleable to a very limited extent (Van Doorn et al. 2016). Westley et al. (2011) have defined "transformability" as "the capacity to create untried beginnings from which to evolve a fundamentally new way of living when existing ecological, economic, and social conditions make the current system untenable" (p. 763). Hence, beginnings can be created, but the outcomes are unclear.

One way of creating beginnings is to mobilize "inner worlds." Identifying values could help to understand what choices of farmers – conventional or agroecological – are grounded in. Herzele etal. (2013) have identified six different types of motivations for farmers to take up agri-environmental measures. Investigating what values determine conventional farmers' practices, what motivates them to sustain certain practices and what keeps them from changing to ecological practices could provide a starting point for dialogue with multiple actors. Training programs for holistic management and systems thinking may offer a way to mobilize inner worlds and induce a paradigm shift, although the results of such trainings are difficult to define and evaluate (Mann and Sherren 2018). In the Netherlands there is little experience with agricultural training that puts strong emphasis on the

psychological wellbeing and internal integrity of farmers, but based on results abroad (Gosnell, Grimm, and Goldstein 2020) such training may be worth investigating. The emergence of the movement of regenerative agriculture, which puts an emphasis on holistic management (Savory & Butterfield, 1999), e.g. going through a self-reflexive process in order to be able make the decisions that align with your core values, might provide an interesting lead to underpin this proposition with empirical support.

Beginnings are the start of a plurality of pathways and endpoints, also reflected in individual trajectories and diversity of farm types and practices of the interviewees. Fostering such diversity of practices implies a different way of governance. Some authors call for communities of self-organization (e.g., Sherwood, Van Bommel, and Paredes 2016), thereby naturally giving way for heterogeneous practices and solutions. Pioneers have an exemplary role and create the first anchor points for a strong network of like-minded people. Focusing on the inner dimension of farmers one should not forget that transformative change also requires political action and changing existing power structures. A strong movement and visibility is important to achieve political support and the removal of barriers. In the Netherlands, organizations such as the Federation of Agroecological Farmers (Federatie van Agroecologische Boeren), Future Farmers Association (Vereniging Toekomstboeren) and the Agroecology Network (Agro-ecologie Network), as well as the national and regional governments play a role in this. Action oriented research might be appropriate to investigate how peer-to-peer exchange and communities of practice, and intervention by governance institutions may interact and reinforce each other. Such future research may focus on the effect of facilitating knowledge exchange, provision of information, and support for redesign of farming systems (Padel, Levidow, and Pearce 2020), on exploring enabling and disabling factors as described by Anderson et al. (2019) in the Netherlands, or on the effect of on-farm or nature education, for both children and adults (Anderson et al. 2019; Mezirow 1997; Taylor 2017), and the links with societal awareness. In collaboration with farmers, this could provide valuable information about how agroecology could be supported in the Dutch context.

Identifying friction and traction in all three spheres provides clues as to what might facilitate the broad transition envisioned by the government. In general, paying attention to the practical sphere – setting attainable or and clear goals – is important to avoid conflict or frustration. Long term vision and support in the political sphere should enhance positive results in the practical sphere. But since societal transition consists of a multitude of individual transitions, intrinsic motivation in the personal sphere is key: attention to the inner worlds is vital to engage commitment and to avoid erosion of persistence of environmental behavior (Ives, Freeth, and Fischer 2020). It is important to note that spheres are interacting and facilitating

change in one sphere effects change in the others. Enthusiasm and excitement in the personal sphere influence and are influenced by tangible outcomes in the practical sphere, which in turn validate new ways of seeing in the political sphere, thereby generating impact throughout all three spheres.

Conclusion

Aiming to contribute to a better understanding of transformational change in agriculture, we analyzed the transformation process of nine agroecological farmers differing in background, starting year and farm type. What they have in common is a vision of a better food system that is based on principles of agroecology. Farmers had different reasons to start agroecological practices. They were grounded in core values and life histories, unique to each person in subtle ways. There were clear similarities in the core values of farmers that underpinned the drive to practice agroecology. Before starting agroecology, interviewees felt these values did not align (sufficiently) with their daily practices. Realizing this acted as an incentive to minimize that discrepancy. The exploration of alternative narratives was characterized by curiosity, critical reflection, and openness to change. The time it took between the first spark of interest in alternative agriculture to implementing practices ranged from several months/years to decennia. After (re)design of the farm, practicing values and seeing evidence of its purpose gave satisfaction, as it felt as meaningful work. The process of achieving internal consistency shaped the transformation pathway in ways unique to each person and the context they were embedded in.

Going against the grain posed challenges, but these were overcome. Seemingly, trigger-events, and a range of positive feedbacks originating in the personal, practical and political sphere were important in sustained commitment. In this study, we make a case for the importance of the personal sphere, or the "inner dimension," often overlooked in sustainability literature, effecting transformational change rather than incremental change. As all farmers are unique, with different values, life histories and personalities, there is no "one-size-fits-all" solution to spur the required transformation of the Dutch food system. Giving attention to the diversity of values, supporting a diversity of starting points, pathways and endpoints allows for adaptation to local contexts and personal preferences and qualities, and seems like an appropriate approach.

Declaration of ethical approval and interest statement

Approval from interview participants for inclusion in the study was obtained prior to the study, during the interview, and after incorporation into the manuscript. No ethical committee was appointed as this is no requirement in the protocol of Wageningen Research if no vulnerable groups or individuals are included in the study.

The authors report there are no competing financial or non-financial interests to declare. Data (interview recordings and transcripts) contain confidential details and can be retrieved upon request.

Notes

1. Agroecological "transition pathways" or "trajectories" are understood as a process or period of change, which can take form in a plurality of trajectories and endpoints (Padel, Levidow, and Pearce 2020), toward a state of the farming system that corresponds to the abovementioned description of agroecology.
2. Note that not all participants identify as "agroecological" per se, but were selected because their practices were found to be in alignment with agroecological principles. Selected farmers are committed practitioners of such principles, but the focus (for example, improving cultivation techniques for large scale arable farms, or co-management of the farm with members) differs from farmer to farmer.
3. Not to be confused with tipping-points, the term "turning point," is used to indicate a change in behavior/farming system that involves practical choices and planning, and follows after the change in mentality.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

The authors acknowledge the funding of WUR knowledge base program KB36 Biodiversity and Nature Inclusive Society (project KB36-003-024, supported by the Ministry of Agriculture, Nature and Food Quality).

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