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# **Exploring attributes of resilience: robustness, adaptability and transformation in European farmer narratives**

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# Exploring attributes of resilience: robustness, adaptability and transformation in European farmer narratives

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## Abstract

Resilient farming systems maintain their structure and functions when confronted with economic, social, ecological and institutional pressures. Understanding of how primary producers manage critical decision points in response to such drivers can help to develop effective support for resilient European food systems. Life experience reported by individuals provides insight into what matters to them. We analyse 46 personal narratives from family farms in five European countries and use comparative thematic analysis to identify drivers of, and responses to, critical change points. Responses are categorised as examples of robustness, adaptation or transformation. Narratives reveal different approaches to risk alleviation, both within and across case studies. Policy-related conclusions suggest that farming systems are ill-equipped for a rapid move away from direct payments, and that narrators are unprepared for climate-change. Coherent long-term strategies are required to manage intergenerational transition on farms.

**Keywords:** risk, resilience, narrative, uncertainty

**JEL Code:** Q120, Z130

## Introduction

Gardner (1995) identified inelastic demand and climatic and biological fluctuations in production as the major justifications for intervention in agricultural markets. More recent coalitions of interests in the political economy of agricultural policy (Swinnen, 2015) have raised new concerns about climate-change, ecosystem degradation, the demands of an increasing global population and, most recently, incipient trade conflicts. Future food security will require “adequate resources to enable adaptability and transformability ... to face the ‘perfect storm’ of increased food demand, scarce water and insufficient energy resources” (Darnhofer, 2014: 471). Business as usual, in terms of analysis, management and government support of agricultural risk and uncertainty developed for the relatively stable recent past, is no longer tenable. Both research and policy development are refocusing on desirable and practical responses (Rotz and Fraser, 2018).

The primary producers who form the foundation of food systems are most vulnerable to increased volatility: their resilience is central to food security. On a global scale, averting critical failures in food supply can only be achieved through adaptation of their production systems (Campbell *et al.*, 2017). The idea of adaptive capacity, grounded in ecological

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systems thinking but extended to include socio-economic and institutional systems (Holling *et al.*, 2002) has become especially relevant. The chronological dimension of this ‘resilience thinking’ is expressed through the concept of adaptive cycles. These are comprised of four successive phases; growth, which leads on to conservation, collapse and eventually reorganisation. The development of resilience capacities in agricultural systems (robustness, adaptability, transformability, respectively representing short-, medium- and long-term responses to uncertainty) allow the tipping points of the major systemic processes, agricultural practices, farm demographics, governance and risk management to be better negotiated (Meuwissen *et al.*, 2019).

So far, most investigation and assessment of the adaptation cycle has been conceptual, deductive and indicator-based, mainly because resilience is an emergent property of the agricultural system, the “result of ever changing patterns of relations, relations that are material, social, cultural” (Darnhofer *et al.*, 2016: 118). Perhaps more surprising is the scant number of studies that use qualitative investigation to explore how resilience emerges from the agricultural system emerge from the lived experiences of actors. The examples that do exist (Herman *et al.*, 2018, Bathfield *et al.*, 2013, and Bouttes *et al.*, 2019) rely on semi-structured interviews as the method of choice. Notwithstanding the power imbalance between researcher and subject, these may also be regarded as validation exercises, prone to confirmation bias, rather than explicit theory-building. Researcher-constructed guidelines add further bias into responses because their prior understanding is based on, for example, flexibility mechanisms, or decisions to convert to organic farming,

This study, in response to such shortcomings, attempts to understand what is and has been important to individual farmers in their self-reported narratives. Its objective is to explore whether the adaptive cycle, as a framework of understanding, can be discerned in life stories and practices of farmers through different stages of the demographic cycle. The narrative approach we use is introduced by a single open question; the relationship is not between an interviewer and subject but the other way around, between a narrator and a listener (Clandinin and Connelly, 2000), so that the organisation and content of the resulting qualitative data is entirely controlled by the storyteller (Jovchelovitch and Bauer, 2000). The narratives are drawn from the contexts of five different agricultural systems across the European continent, and comparative analysis is used to determine the contextual influence of farming types and structures, and the socio-economic and political influences on them.

The sections which follow include further description and discussion of the concept of resilience thinking, as applied to agricultural systems; an account of the development and implementation of our narrative interview method; brief description of the analytical results of narrative data from the five farming system cases; discussion of these results in a comparative, cross-case context; and conclusions that highlight the overall insights obtained, to illustrate how policies and other forms of support could reinforce scope for enhanced risk management and resilience in European agriculture.

## **Resilience Capacity**

Resilience has emerged as an increasingly popular metaphor to deal with major social and political questions, although Knickel *et al.* (2018: 198) suggest that it is prone to misuse “as a buzzword with little clarity about its meaning”. Thus, careful consideration and definition of resilience, and clarity concerning the context in which the term is used, are particularly important, especially for understanding processes of change in socio-ecological systems.

Resilience thinking was originally applied to portray succession processes in eco-systems. Socio-ecological systems are less deterministic, as they include scope for intent and agency, particularly for efforts to address disruptive changes; consequently, not all farming systems will necessarily follow all the adaptive cycle's stages of growth, conservation, collapse and reorganization (Apeldoorn *et al.*, 2011). Nevertheless, the resilience thinking approach draws attention to the phases in system dynamics other than growth or conservation. In agricultural systems, especially, possibilities of collapse and reorganisation can be integral parts of its adaptive cycle, particularly with increasing external economic, social, ecological, and institutional pressures.

An extended focus on this form of resilience thinking produces two opportunities. Initially, resilience that produces either maintenance of equilibrium, or rapid return to it in an agricultural system, is relevant during a conservation phase. However, as socio-ecological systems shift towards collapse, the perspective that was relevant during the conservation phase becomes increasingly inappropriate, and more transformative system resilience capacities, appropriate for different phases of the adaptive cycle, need to be recognised, improved, and perhaps entirely transformed to maintain outputs of agricultural systems that are of essential importance for social welfare.

Focusing on eco-system services, Walker *et al.* (2004), Folke *et al.* (2010) and Anderies *et al.* (2013) identified three successively radical resilience capacities: robustness, capacity to withstand stresses and shocks; adaptability, capacity to manage the enterprise mix in response to shocks and stresses but without changing structure and feedback mechanisms; and transformability, capacity to significantly change the internal structure and feedback mechanisms of the farming system in response to either severe shocks or enduring stress that make business as usual impossible. Their framework also distinguishes specified resilience (to existing, recognised challenges) from general resilience (capacity to deal with the unknown, uncertainty and surprise). Drivers of agricultural system change also vary through time, space and intensity. Thus, adapting Maxwell (1986), specified resilience challenges can be subdivided into noise (common perturbations, both in occurrence and magnitude, usually expected by farmers), cycles (recurring periodic change, in which lengthier cycles make identification more difficult); and trends (gradual change over time without a clear cycle). General resilience challenges are categorised by Maxwell as shocks (unusual perturbations, either in occurrence or in magnitude, the rarer of which are increasingly difficult to anticipate).

Our study explores whether these deductive conjectures correspond with a valid empirical foundation. We are aware of two major difficulties that our approach intends to address. Firstly, documenting observed challenges and responses in an agricultural system involves framing. This involves reductionism that risks treating the conceptualisation of complex, nested interactions within, “a population of individual farm systems that may have widely differing resource bases, enterprise patterns, household livelihoods and constraints” (Giller, 2013: 3), as if it were a concrete reality. Nevertheless, such reification may be less challenging where experiences and actions of people who are part of and operate within such farming systems can contribute insights into its structure. Secondly, individual perceptions may be distorted by further framing of preanalytical vision (Boettke, 1992) that includes the farming system approach (LeBoeuf and Shafir, 2003) and interviewer bias through the focus and style of the evidence-gathering interaction (the consequences of which are explored in Smyth and Williamson, 2004). We use a type of investigation, described in the following section, which reduces these biases by giving precedence to the understanding and experience

of actors. We use this to probe the extent to which an abstract conception of the farming system differs from their lived experience.

## **Studying Farmer Narratives**

Narrative analysis is a “family of methods for interpreting texts that have in common a storied form” (Riessmann, 2008:11). So far, narrative analyses have investigated specific elements of farmers’ life stories, such as entry into farming (McDonald and Macken-Walsh, 2016); exit from it (Riley, 2011; Cassidy and McGrath, 2015); and strategies of resistance or resilience in family farming businesses (Morris and Evans, 2004). Having an apparently purposeless approach, obtaining largely unprompted oral autobiographical narratives, helps to understand how the narrators view their interaction with the farming system of which they are a part. For that reason, our focus has been on the *farm* life rather than individual biographies, so that we can explore how the latter “intersect with and on the farm and in conjunction with those biographies of others” (Riley, 2011: 19). These narratives can reveal the context and rationale of farmer decision-making, responses to change, uncertainty and risk and how farmers manage critical decision points in their businesses. The approach encourages narrators to tell their story in their own words, as far as possible without imposing any prior structure or preconceived ideas. People recall what happened, put experience into sequence, find possible explanations for it, and play with the chain of events that shapes individual and social life. This is a means to explore “questions of social science or history that relate to social phenomena that are tied to people’s experiences and have biographical meaning for them” (Rosenthal, 2004: 51): “... telling a story is the only way to come close to an integral reproduction of what happened at that time” (2004: 53).

We collected personal histories in five farming system case-study regions, between May and October 2018 (Coopmans *et al.*, 2019). The two-stage, purposive sampling approach selected regions based on system functions, and then farms, based on different stages of business succession. The first stage aimed to represent variation across five dimensions: (i) challenges (economic, social, environmental, institutional); (ii) agro-ecological zoning; (iii) farming type (sector, intensity, farm size, organisational form); (iv) produce (high-value products, commodities and services); and (v) influence on public goods (landscape, water quality, biodiversity). The five farming systems selected ranged from purely livestock (Flanders), through more mixed livestock/arable (Southern Sweden) to specialised arable (East Anglia, Northeast Bulgaria) and permanent crops (Central Italy) and from relatively small owner-operated businesses to large family-owned corporate businesses (what is large, of course, “depends on the nature of soils, climate, and technology where the land is located”; Stanton, 1978: 735). Within these farming systems, narrators were selected purposively, mostly through gatekeepers. To reflect farmer life stories across their life-cycle, the intention was to interview one third at early-career stage, one third mid-career and one third late-career, nine in total in each farming system studied.

Applying the same approach across regions in five different farming systems required two main additional provisions. Firstly, to ensure that the single-question narrative method was applied uniformly all researchers attended a training event prior to fieldwork. Secondly, recordings of life histories were gathered and analysed in the native language of the narrators, but are reported on in translation into English (see Brislin, 1970). Where feasible (in most cases, although not Belgium), two researchers visited each narrator to listen to the life story. This inevitably incurs higher costs, but the advantages include having a greater sense of a normal conversation, and the opportunity for both researchers to more carefully observe the nonverbal demeanour and reactions of the narrator. After the interview, immediate discussion

between the researchers stimulates memory, cross-checking and, as Bechhofer *et al.* (1984: 99) note, “greatly increases the possibility of constant interaction between field-work and theory-development”.

A single question was used to initiate the story, with scant qualification beforehand, with only expressions of interest and encouragement in the first part of the interview. Any subsequent exploratory questions were solely devoted to clarifying the internal structure of the narrative. Inevitably, the stories of these farmers combine life and business histories, revealing the production changes that the narrators believed important and what has subsequently occurred. Although the number of interviews was predetermined, no new insights arose from later interviews, which was sufficient to assure validity according to the inductive saturation criterion (Saunders *et al.*, 2018). The main form of the narrative and the issues it raised were discussed in the post-narrative debrief, and listening to the recording of the narrative shortly after that allowed efficient identification of key events, turning points or issues needing clarification and the construction of a time-line of significant events in the farming narrative. Issues requiring clarification, or pivotal events which would benefit from further exploration were explored in a follow-up contact, usually by telephone.

Conversations were transcribed, and coded using NVIVO software (except in the Bulgarian region, where manual coding was used). Inductive coding of change points was undertaken in each farming system, although closely similar codes covered most of the turning points identified in respective narratives. The coding strategy utilised a simple, flat thematic structure to categorise different kinds of risks, to describe their effects and to explore the narrators’ reported responses to them. This thematic approach allowed us to explore how well the drivers of trends, cycles and shocks were reflected in critical turning points, and whether robustness, adaptation and transformation could be observed in risk management and decision-making in relation to their production, demographic and policy adaptive cycles, and any interactions between these cycles. We gave narrators the chance to check our interpretation, by sending them an extended summary of their interview that included selected quotations and timelines.

Once fieldwork and analysis were complete in each region, the turning points in each narrative, the drivers of change, the responses to the driver and the types of resilience demonstrated were tabulated and examined for patterns of similarities and key differences between countries and between career stages.

## **Results**

Outcomes of the fieldwork and analysis process are initially presented in brief descriptions of key themes that emerge from the narratives in each farming system. Individual instances of turning points are then tabulated, relating drivers to responses. To complete the analysis, drivers are categorised as shocks, trends and cycles, and responses as robustness, adaptability and transformation, respectively. From interpretation of the original narratives, drivers are organised in a continuum, ranging from those arising purely internally to the most external factors.

Flemish narratives portray a predominantly single-operator dairy farming system, under pressure from lack of available land, which exposes businesses to financial instability. There is a strong feeling of under-compensation for the heavy workload, but devotion to the farming way of life is nevertheless strong. Coping in this environment means either minimising costs or diversifying into non-agricultural activities. Family relations are a fundamental part of the management of the very large corporate arable farm systems investigated in Northeast

Bulgaria, though narrators indicate that this legal structure provides a means to reduce personal financial risk. Shortage of labour is also a major concern; cooperation, an activity tainted during the socialist period, remains shunned. Central Italian hazelnut producers underline the long-term business perspective necessitated by the nature of their permanent crop. Their businesses are strongly vertically integrated through cooperatives and a few large and powerful purchasers of their product. In Southern Sweden, intensive egg and broiler producers have been actively recruited by processors and packers to expand their supply base. The activity fits well with the challenges of arable farming, where it is mostly adopted, as it provides additional income to employ two farm family generations. In Eastern England, narratives from cereals producers indicate another farming system under pressure. The high and rising cost of machinery is a major concern, alongside weed problems that are becoming more acute as agro-chemicals face more restrictive regulation. Table 1 provides a summary of the systems investigated, and the challenges facing narrators in each context.

**Table 1:** Case Study Systems and Challenges

<i>Region and Country</i>	<i>Farming System</i>	<i>Challenges</i>
Flanders, Belgium	Dairy farming	Increasing average farmer age Farm succession planning often lacking Increasing regulatory pressures (water quality, GHG emissions, soil erosion) Decreasing farm numbers and increasing farm size Intensification through increased mechanization and automation Reliance on family labour
North East Bulgaria	Large scale arable farming	Reliance on hired mechanised and manual labour Skilled labour difficult to retain Disparity between Bulgaria and other Western European countries in term of basic payments Legislation complicating relationships between land owners and tenants
Central Italy	Small scale perennial crop production (hazelnuts)	Number and size of farms increasing in the region Increasing average farmer age Market and price volatility due to political instability in main competitor (Turkey) Consumer concerns over high fat/sugar foods (e.g. Nutella) reducing market demand Dominance of market by a few buyers Environmental challenges (e.g. water shortage and newpests that challenge crop quality) Growing civil society opposition to spreading hazelnut plantation
Southern Sweden	Intensive egg and broiler farming	Dominance of a few processing companies, particularly in the broiler sector Limited access to land Long working hours Dependence on family relations
Eastern England	Large scale arable farming	Water shortage Livestock enterprises increasingly rare Technological advances (such as in machinery) increasing fixed costs Vulnerability to rising sea levels





In total, 46 narratives were collected across the five farming systems. Although our original aim was to collect one-third of the narratives at early, mid and late career stages respectively in each region, some operational complications meant that this was not always possible. In Northeast Bulgaria, particularly, no early-career farmers could be recruited. This was probably because, following the political and economic changes of late 1989 and more powerfully since the adoption of the CAP in 2007, farms were enabled to expand to the extent that opportunities for new farmers are severely limited. The large-scale corporate structure also produces smoother career progression than in the other family-based farming systems we studied. Table 2 outlines the distribution of narratives by farming system, career stage and gender. Occasionally, more than one family member was present and made a valuable contribution to the narrative.

**Table 2:** Summary of Narratives collected in the Five Case Study Regions

	<i>BE</i>			<i>BG</i>		<i>IT</i>			<i>SE</i>			<i>UK</i>	
Narratives collected:	9			10		9			9			9	
	M	F	C	M	F	M	F	C	M	F	C	M	F
Early-career stage	3					2		1	1		1	3	
Mid-career stage	3			6	2	3			2	2		2	1
Late-career stage	1	1	1	2		3			3			3	

M=Male and F=Female narrator; C= Couple

The following tables summarise types of drivers, separated into trends, cycles and shocks, and show responses in terms of robustness, adaptation or transformation. A single, unambiguous driver is rarely identifiable as the cause of a major change, nor were responses normally unmixed. Narrators described their experience of key life events as complex processes, shaped by multiple influences. To respond to this, we order the stimuli codes that emerge from the narratives from those that mostly arise within the farm system, to those that were chiefly externally produced. As a result, the same influences (and sometimes even the same turning points) can be relevant in more than instance in Tables 3-5.

**Table 3:** Thematic Classification of Trend Drivers and Resulting Responses

<i>Trends</i>	<i>BE</i>	<i>BG</i>	<i>IT</i>	<i>SE</i>	<i>UK</i>
Personal health	T				R
Intergenerational change	R R R T		T	A	
Long transitional cycle	R T				A A A
Falling profitability	R		A A T	R A T	A A A
Underinvestment	R A A				
Limited land availability	R A		A A	A	
Opportunity – market	R	R A	A A	T T T T T T T	
Opportunity – technology		A	A		
Opportunity – transferable skills	R	A A T			T
Opportunity – miscellaneous	R	A A	R A A A		A A
Opportunity – land	R A	R A A A	A A A T T		
Constraint - labour		R A A			
Resource – water		T			
Supply chain	R A		A A A A A T		
Opportunity – policy		R A A	A A A A T	A	A A
Constraint - policy	T	R		A	
Robustness	12	5	1	1	1
Adaptation	5	13	22	5	10
Transformation	4	2	6	8	1

Note: R=Robustness; A=Adaptation; T=Transformation

**Table 4:** Thematic Classification of Cycle Drivers and Resulting Responses

<i>Cycles</i>	<i>BE</i>	<i>BG</i>	<i>IT</i>	<i>SE</i>	<i>UK</i>
Changing work-life balance				R	
Intergenerational change	R (x11) A T	R R A	R A	A T	R R A A A
Retirement	T				A
Opportunity – transferable skills	T				
Constraint financial				A	
Constraint land				T	
Opportunity – land	A			A	R A
Opportunity – miscellaneous	R	R		A	
Robustness	12	3	1	1	3
Adaptation	2	1	1	4	5
Transformation	3			2	

Most drivers interpreted as trends result in an adaptation response. In Flemish narratives, more responses to trends are explained as robustness. This difference arises because of land constraints and predominance of sole proprietorship, restricting change and hindering opportunities for adaptation. In Southern Sweden, most responses are explained as transformations, the result of combining arable systems with poultry farming. Of the 21 trends that lead to transformations, only two are policy related, six arise from market or supply chain opportunities, and four are prompted by intergenerational change (personal, rather than farm system, transformations).

Robustness is the dominant response to cycle-related drivers, especially in the Flemish dairy systems and in arable farms in Northeast Bulgaria. Adaptation is rather more prominent in Southern Sweden and Eastern England. Cyclical drivers only lead to transformations in Flanders and Southern Sweden but there are no transformations in response to cycles in Bulgaria, Central Italy and East Anglia.

**Table 5:** Thematic Classification of Shock Drivers and Resulting Responses

<i>Shocks</i>	<i>BE</i>	<i>BG</i>	<i>IT</i>	<i>SE</i>	<i>UK</i>
Human health	R R R A A		A	R A A	R A
Death	A			T	R A A A
Family breakdown				R	R
Intergenerational change					A
Extended intergenerational transition	R				
Redundancy		A		R T	A
Financial crisis	R				
Fine	R				
Weather event	R	R	R R	T	
Legal penalty				R	T
Animal health	R				T
Limited land availability	R				
Supply chain	R				
Planning	T	A		A	
Policy	R				T
Robustness	11	1	2	4	3
Adaptation	3	2	1	3	6
Transformation	1			3	3

Health shocks appear in many farm stories in relation to the narrator's predecessor, for example the death or serious illness of a parent, which result in their takeover of the farm. The responses to these shocks take the form of robustness and adaptability, rather than of transformation. Of seven shock events that lead to transformations, one is policy-driven (release of capital through the sale of the dairy herd and quota), whereas others involve animal health, death, fire, unemployment, supply chain and planning issues. No transformations in response to shocks are mentioned in Northeast Bulgarian or Central Italian narratives. In Northeast Bulgaria, the political changes that occurred prior to accession to the EU drove continual and universal agricultural transformation, but have diminished and stabilised since adoption of the CAP in 2006. Weather-related shocks are frequently

mentioned in Central Italian narratives, but their farming system has a degree of resilience due to its long-term nature and distribution of land parcels across several microclimatic regions.

There are few major differences in response types across the three career stages. The longer span of time experienced by later-career farmers may influence their narratives. Recall of drivers of change may increase self-editing of their stories, mainly because their farming life is likely to have included more of them. Late-career narrators, closer to retirement and having had the opportunity to shape their businesses over a prolonged period, seem less likely to have made major changes to their systems, and demonstrate robustness rather than adaptability. Bearing this in mind, the results indicate that, in all career stages, farmers respond to trends by adapting their systems. As they move through their careers, as a response to shocks they mention changes that we characterised as adaptation less, and those associated with robustness more; similarly, through their careers, farmers are increasingly likely to recall responses characterised as robustness as a result of cycle drivers.

## **Differences and Similarities**

A key finding from our analysis, compared with what might be expected (e.g. Hazel and Wood, 2007), is that farmers do not consider external shocks to be of major importance in their farm stories. Almost as prominent is that the finding that robustness is the most predominant response to cycles and shocks.

Disasters, as unexpected shocks, including extreme weather events, fires and animal disease outbreaks, are identified in narratives in all countries. Extreme weather, such as frost and drought (Central Italy), severe rainfall (Flanders) and hail (Northeast Bulgaria) all result in little or no change to the farm system, despite apparently quite large impacts in some cases (for example, extreme hail damaged 26% of crop area in one Northeast Bulgarian narrative). Farmers appear to accept that such weather events and associated losses are just part of expected variation in farming circumstances ('noise', in Maxwell's 1986 categorisation). They deal with this as it occurs and move on, demonstrating robustness of their farming systems to climatic events. The permanent crop nature of Central Italian hazelnut production means that the severe frosts and droughts that occurred in the space of two years (2017-2018) are perceived by a narrator as "critical" years that "were part of the game". The overriding response to such shocks, robustness, involves absorbing the challenge and carrying on. In contrast, narrators identify internal drivers such as intergenerational change, health, illness and mortality and family upheavals as much more important.

Consequently, a strong motif of most stories is inertia, and that trends affecting management mostly induce gradual adaptations. Creeping change appears frequently, a process of gradual adaptation which goes beyond robustness but is nevertheless not a discrete farm system adaptation. Because of the deliberate collection of narratives by career stage, stories stretch back over varying spans of time. Many narrators with longer time frames convey the impression of continuous creeping change, unremarkable at any point, but overall amounting to a stronger change in direction. Correspondingly, most responses documented as transformations are rather weak. This is possibly because narrators only considered radical transformation when all other options had become infeasible, so that it appears to be the response of last resort, rather than as one among many alternatives.

This suggests that resilience responses lie on a continuum, and that judgements about where boundaries lie between categories will inevitably be subjective and ambiguous. In Southern Sweden, transformations principally relate to market opportunities in the poultry sector.

Similarly, in Central Italy demand from the processing sector and better harvest technology together stimulated the replacement of viticulture with hazelnut production.

Robustness appears to be the most common response reported to all drivers in Flanders. Nevertheless, there are indications in these narratives of a build-up of pressure that will necessitate more radical transformation. Competition for Flemish land for urban development, and the highly regulated nature of the land market (Ciaian *et al.*, 2010) make this a limiting case, but throughout all narratives there is a sense that transformation in the agricultural sector may have been less, and slower, than in other industries due to the predominance of policy restrictions, which have entrenched structures and reduced flexibility (Moreira, 2015). The Northeast Bulgarian narratives also reveal a dampening of volatility of both land price and rents following the introduction of CAP subsidies.

The impact of scale on farming business resilience, whilst rarely explicitly mentioned by narrators, is apparent in many of the narratives. Increasing scale is often central to facilitating a smooth transition from one generation to the next, and for the financial sustainability of the business. As Table 3 shows, opportunities with respect to increasing scale via the acquisition of new land are dominated by examples from Central Italy and Northeast Bulgaria. In the Central Italian narratives, key drivers for land purchases are the high profitability of hazelnut production, and in some cases, the desire to establish a farming career. The high profitability of the enterprise indicates that existing farmers are able to raise finance to acquire extra land, as and when they are ready to expand. However, the high land price and restricted availability in the most desirable growing regions mean that much of this expansion occurs in more marginal growing areas. In Northeast Bulgaria the land situation is unique, compared with the other contexts. EU support payments and ready access to finance provided the opportunity to purchase or lease apparently abundant, underutilised land in many areas over the last decade, and resulted in rapid farm expansions.

Conversely, some narratives mention constraints on local land availability, due to high land prices or simply lack of land for sale, also acting as a driver for change. Central Italian hazelnut farmers purchase land, but in more marginal growing areas. This adaptation ensures business resilience, but also comes with added risk, as yields in these marginal regions can often be lower due to poorer growing conditions and greater prevalence of drought. However, one Italian narrator also sees advantages in having land parcels in different regions:

*“Our farm is fragmented in several plots. This has its disadvantages because of the distance between the various plots but also the advantage of compensating the years with non-positive climatic events that impact differently in the various plots.”*

A Swedish narrator states that the location of the family farm close to Stockholm restricts access to additional land, so the family chose to diversify within their current resource base rather than try to expand. In their narrative the local land constraint turns out to be an opportunity, as they have diversified by producing meat baskets to serve the large adjacent population of potential customers.

In Flanders, restricted land availability is mentioned in many narratives as a constraint to expansion. Competition with other agricultural and non-agricultural businesses, urban development and ‘pension farmers’ (land owners who have given up farming themselves and lease their land to tenants) are identified as drivers for high land sale prices and lack of available land. In the Flemish context of increased specialisation and land consolidation, narratives confirm the finding of Roest *et al.* (2018) that farmers face two options: further specialisation through sustainable intensification, or diversification. Diversification, rather than expansion, is the dominant adaptation pathway observed in the Flemish narratives.

Scale also plays a role in terms of the ability of the business to absorb health and wellbeing shocks that the narratives identify as key drivers to change. Sole owner-operator businesses, such as those prevalent in Flanders and the East Anglia, are particularly susceptible if the farmer experiences ill health or injury. In one Flemish narrative, the farmer is diagnosed with a long-term health problem that results in a radical transformation of the future direction of his business so that he can continue farming; he shifts from milking cows to cooperating with his neighbour and rearing dairy cow replacements. In the larger businesses observed in Northeast Bulgaria, farms employ large workforces, including various members of the farming family, so the responsibility of individuals to carry out all the farming activities is not apparent.

Scale issues limiting the ability of farms to provide incomes for two family generations are highlighted in several narratives in East Anglia and Southern Sweden. Increased longevity has stretched the working lives of parents, who continue to farm at later ages and are either reluctant, or financially unable, to retire. Consequently, there are several examples (also in Flanders) where the successors return to the farm to begin the process of intergenerational transition in their late 30s. Even then, the retiring generation is often still involved in the business, either a source of mentoring and support or, as in some narratives, causing stress due to interference or conflicting ideas.

Extended intergeneration change draws attention to social and relationship issues associated with the succeeding generation having careers and families before coming home to begin their farming career. Many instances in East Anglian, Southern Swedish and Flemish narratives include extensive discussion of the effect of heavy workloads and work-life imbalance on well-being. These narrators find it challenging to achieve a balance between getting outstanding farm results and spending enough quality time with their family. Among narrators with younger families, expectations regarding parenting roles and hours of farming work appear to be different. Perhaps this is because they have prior experiences working in non-farming jobs, or alternatively, due to changes in traditional family gender roles (Contzen and Forney, 2017). One early-career East Anglian narrator describes this difference:

*“...well I don’t really remember dad being hands on in our upbringing so much, whereas now it’s... expected and actually I enjoy it, but we’re trying to balance that with the ... particular lifestyle of... I say lifestyle of job... career of farming.”*

Another intergenerational transition challenge seen to drive change is where the succeeding generation is expected to generate income to support their retired parents. In a more extreme form, a death in the older generation either causes farms to be split (as in one East Anglian narrative) and reduces the farm size; or narrators have had to buy out their siblings and their indebtedness consequently increases. In Southern Sweden, bridging of this increased intergenerational transition has been enabled by the active recruitment of arable and livestock farmers by broiler companies to develop broiler production. Similar income diversification to increase employment opportunities for multiple generations is observed in Flanders. These, though, do not always succeed in the longer term: farm education activities, one example, improved financial security in the short term, but due to the high labour requirement added to that needed for primary farming operations, it did not last. This also highlights constraints associated with small scale.

Falling profitability, underinvestment and financial problems associated with small scale are common themes in the narratives. Declining returns appear as a gradual trend in several life stories. In recent decades, the general farming business environment in the Flemish case-study area has been characterised by small-sized farms buffeted by price volatility, and in these

conditions of uncertainty investment decisions have been risk-averse. Nevertheless, where profitability falls to unacceptable levels (for instance, where a successor needs additional income) investment requirements become inescapable. For one Flemish farmer, major investment decisions had all been postponed by his father, so that the burden of added debt repayments from building new livestock housing and installing a milking robot occurred simultaneously with the early years of his management. He took a proactive stance, with a clear plan to develop and expand the farm:

*“At once I had to keep up with everything and to improve everything at the same time. I had to take over a farm business, and I also had to make a huge catching-up for the farm business. And that was sometimes a lot at the same time.”*

Until recently, quota policy limited expansion of output in dairying. For one Flemish narrator, some scope for expansion arose from quota purchase and allocation from the national reserve, but eventually *“if one wanted to buy quota, then one needed to take over (another) farm”*. Another Flemish narrator describes, with sadness, a situation where a close friend and neighbour’s farming business became bankrupt, although he was the subsequent purchaser of the land to make his own farming business more sustainable.

In a Central Italian case, the rising cost of labour and potential productivity improvements twice encouraged mechanisation: in 1973 introducing mechanical harvesting of hazelnuts; and in 1980 using a self-propelled harvester. Several other Italian narratives also underline the importance of investing in technological innovation to improve labour efficiencies, whilst others identified, to a varying degree, collaborative efforts in cost reduction and marketing power to overcome their relatively small scale. A consequence of mechanisation in the early 1970s was reduction in the traditional roles that women used to play in family farming, mainly in the harvesting operation. This demarcation between gender roles on hazelnut farms continues to the present. Narratives either show women not at all involved in hazelnut production, sometimes working off-farm, or involved in non-agricultural but related activities on the farm, such as agri-tourism. This illustrates how increasing agricultural mechanisation contributes to change in the social and demographic structure of farming communities. Whilst this instance of enduring gendered relations was one of very few that arose in the narratives, the fact that gender was not explicitly mentioned in them does not mean that it is not an issue. Rather, the issue appears not to be easily elicited when using the narrative approach.

In many East Anglian narratives, provision of various services to other farms under contract (‘contracting’) has a clear role in addressing small scale and the high and rising cost of machinery. Two approaches to contracting characterise a distinct divergence in management strategies: in one (adopted by the majority) farmers undertake contract work on other holdings; in the other conversely, farmers contract-in others to undertake varying proportions of the farm operations. The first usually involves continual expansion of the farmed area, through land purchase and rental, to spread capital costs over an increasing hectareage. The second reduces capital costs and labour inputs to an absolute minimum, creating a very lean business structure. In many cases the choice of strategy is dictated by resource availability, particularly capital, but also labour and skills. In one narrative, a combine harvester catches fire, and this stimulates the narrator and his father to completely rethink how the farm business operated, thereafter shifting gradually from having their own machinery to contracting in all services. The fire happened a long time ago, and transition to the current business model occurred over an extended period, but the effect on farm business philosophy and operation is enduring.



Relatively few of the farm system changes described in narratives are described as resulting directly from financial pressures, although the issue arises often, appearing as another example of background noise. Notably, none of the turning points in the Northeast Bulgarian narratives are associated with financial pressures, even though much of the narrators' conversation focuses on investment in the infrastructures necessary for modernisation of farming practice. The major financial pressure leading to change is falling profitability. Often this illustrates the classic microeconomic production choice model; substitution between enterprises occurs when their relative profitability changes. The Central Italian and Southern Swedish farming systems closely correspond to this type of reaction. In most other narratives, frictions significantly hold back smooth substitution between outputs, particularly due to problems of small scale in Flemish and, interestingly, East Anglian farming systems. In East Anglia, despite relatively large land areas of holdings, ever more area is required to absorb rising costs of machinery. There, as in Flanders, the high cost of land as an input and the immobility of labour act as constraints on adaptation or transformation, at least until other pressures become acute.

## Conclusions

Shocks, trends and cycles affecting farm systems have a variety of impacts on the farm systems discussed in these narratives. The different types of outcomes, regularly appearing across very different farming systems, mostly demonstrate robustness. Nevertheless, adaptation and (more rarely) transformation do occur, and result in changes to enterprise mix, agro-ecological impacts, and overall shifts in encompassing farming systems. These narratives are consistent with more general studies of farming systems dynamics (for example, Vliet *et al.*, 2015), but provide enhanced individual detail and causal explanation. Particularly, they raise questions about farming's heavy reliance on public intervention in various forms, and the scope of future policy reforms to enhance agricultural resilience.

As well as providing details of major turning points, narratives elucidate farmer mindsets, and what they did not say is of almost equal importance as the spoken material. Drivers that narrators reacted to as noise receive little or no consideration; what emerges instead as the most problematic topic is intergenerational transition. That many of the external drivers affecting farm systems, such as weather events or price volatility, are considered as noise may be due to the stabilising effect of agricultural support systems. Insurance is mentioned rarely, usually connected to asset or weather risks. Only one out of all narrators, in Northeast Bulgaria, mentions hedging of crop values to insure income, but then only to emphasise that improved agricultural resilience is hindered by generalised resistance to financial innovation. Narrative examples of robustness in response to various drivers often appear to relieve pressures or forestall opportunities for adaptation and transformation, mirroring conclusions from the UK House of Lords (2016) report on agricultural price volatility.

There is long-term ambition to replace basic income support with income insurance (for example, Madre and Devuyst, 2016, of the Farm Europe thinktank; also supported by Defra, 2018, as desirable for post-Brexit farm policy). While the CAP has provision and resources for income insurance and mutual stabilisation schemes, few are in place. Those that do exist require substantial subsidies, and even then, uptake is relatively low (Meuwissen *et al.*, 2003). The farm systems represented in our samples seem ill-equipped for any major shift from direct payments to income insurance, and winning the confidence of farmers to make such a change would require a carefully prepared strategy. The narrative contexts in Flanders (especially) and in Southern Sweden and East Anglia indicate that structural issues constrain

farmers' ability to change their approach, and these require resolution before novel income stabilisation tools can be considered as central elements of policy.

Narratives only rarely identify agri-environmental policy as either a driver of, or (by adoption) a response to, system change points. Agro-ecological issues stimulate change, or constrain expansion or intensification (especially nitrate groundwater pollution in Flanders, and restrictions on agrochemical use in East Anglia), but again appear as noise, playing little role in their business approach. In all 46 narratives, only one mention occurs of the effect of climate-change, and this in an equally matter-of-fact way. Unsaid elements of narratives may indicate unpreparedness for some of the more far reaching environmental future changes wrought by local climate-change effects on agronomy and biodiversity interactions.

The other major result emerging from narratives is that of the increasing complexity of farm intergenerational transitions. The variety of causal influences they describe range from land tenure and tax law, state pension payments, retirement of farm workers, greater longevity of farmers, and direct payments and the use of contractors to perform agricultural operations. In the face of the intergenerational transition problem, measures for setting up young farmers and retirement aids for farmers are not effective (as Zagata and Sutherland, 2015, argue), especially in comparison with the spiralling cost of farmland, which makes agriculture increasingly a hereditary profession.

Necessarily, none of the narratives analysed here are of families that have left agriculture at the transition stage. Some stories make references to this occurring in neighbouring holdings, with amalgamation and consolidation the inevitable outcome. The problem they identify frequently is of too few farmers exiting, rather than of insufficient young farmers entering. As younger farmers tend to be better educated, more likely to undertake long-term investments and swifter adopters of new technology, this has consequences for resilience. Public interventions that could tackle barriers to farming entry are predominantly Member State responsibilities, but in the framework of agricultural policy after 2020, an urgent priority for improved farming system resilience is to develop support for succession planning through vocational training and advisory services.

While the unstructured, unprompted narrative interview provided rich and substantial insights for exploration of farmer and farm business behaviour, some major gaps emerged as important for completing an improved understanding of resilience. As noted, instances in narratives describing cessation of farming by others are mostly related in terms of effect on the narrator's own story. The negative case, farms that were not *de facto* resilient, could be explored through further careful and sensitive narrative interviews of former farmers. Much more difficult is identifying and exploring opportunities to react that have not been taken up, where a potential system change point has not been recognised. Subjectively, we believe that some instances are evident in these narratives, but this perception is not shared by the narrators themselves. It could be that such lack of recognition is an indicator of vulnerability and, if so, needs to be considered as an important theme for future investigation.

A further outcome indicating future research needs relates to development of modelling proxies for internal drivers, whether shocks, trends or cycles. Noise – which includes several impetuses that are frequently considered as drivers by quantitative researchers (see, e.g., Zimmermann *et al.* 2009) – is not perceived as a causal stimulus by narrators, and their reaction in terms of almost instinctive incremental adaptation indicates that a review of resilience categories might be required.

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