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# 8

## *Historical Legacies and Current Challenges for the Future Resilience of the Farming System in the Altmark*

FRANZISKA APPEL, ANNEKE MEIER  
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### 8.1 Introduction

Throughout Europe, farming systems experience multiple challenges which put pressure on the performance of their essential functions and long-term resilience (see Chapter 1 and Meuwissen et al. 2019 for the introduction to the resilience concept). This chapter provides insights into the main factors that shape the resilience of the farming system in the Altmark, the German case study within the SURE-Farm project. The farming system in the Altmark represents a structure typical of Eastern German farming systems due to its specific historical trajectory. Until the point of research, little was known about how historical circumstances and current dynamics shape the farming system's resilience attributes and capacities. The chapter aims to shed some light on these processes by providing selected findings of the SURE-Farm project supplemented by further literature focussing on the region. The findings are based on a set of qualitative research tools applied during the SURE-Farm project, such as key informant interviews (*Demographic and Learning Interviews*), focus group discussions (*Risk Management Focus Group*), and participatory impact assessments (*FoPIA I and II*). Table 8.1 provides an overview of the research tools and participants. After the system went through a transformation from the socialist to a market economy in the past three decades, currently adaptability appears to be the strongest resilience capacity. The chapter closes by presenting future strategies, suggested by workshop participants and interviewees, to enhance the resilience of the farming system.

### 8.2 Structural Features of the Farming System

The Altmark is located in the German Federal State of Saxony-Anhalt and captures important features of the large-scale agricultural

**Table 8.1. Overview of applied methods in the Altmark case study**

Method	Date	Participants' institutional affiliation	Reference
Farm Demographic Interviews	05–11/2018	12 farmers	Coopmans et al. (2019)
Framework for Participatory Impact Assessment I (FoPIA I)	01/2019	5 farmers, 3 politicians, 1 NGO, 1 researcher, 2 consultants	Paas et al. (2019)
Framework for Participatory Impact Assessment II (FoPIA II)	02/2020	5 farmers, 1 consultant, 1 NGO, 3 politicians, 1 machinery ring, 2 public agricultural support institutes	Accatino et al. (2020)
Learning Interviews	05–11/2018	12 farmers	Urquhart et al. (2019)
Risk Management Focus Group	06/2019	3 farmers, 1 consultant, 1 bank, 1 assurance company	Soriano et al. (2020)

*Source:* own compilation

structures of Eastern German agriculture. The region has a relatively high proportion of grassland in agricultural land, at nearly 27 per cent. The soil quality is rather poor, and the arable farming yield levels are relatively low. The majority of the land is cultivated by farms with more than 200 ha. Farm types are heterogeneous, but mixed and arable farms are most prevalent. In terms of numbers of farms, individual full and part-time farms as well as partnership farms dominate the Altmark. Despite most of the farms being family farms, they are often ten times the size of family farms found in Western Germany and rely on hired labour. Although farms categorised as legal persons (mainly limited companies and producer cooperatives) only account for ~10 per cent of the farms, they farm 45 per cent of the agricultural

land. The family and cooperative farms have a high share of loan capital and rented land, and therefore a relatively low capital base. The main commodities produced are cereals, oil seeds, potatoes, and sugar beets as well as meat and milk, which are marketed as standard via wholesalers, large dairies, and slaughterhouses. Livestock production is dominated by large stocks. Fattening pigs are mainly kept in herds of more than a thousand animals and dairy cows in herds of 100 to more than 500. Around 40 per cent of the dairy cows and 53 per cent of the specialised dairy farms in Saxony-Anhalt are located in the Altmark, although the region contains only 23 per cent of the agricultural land of Saxony-Anhalt (in 2007) (StaLa-Statistisches Landesamt Sachsen-Anhalt 2008, 2014), emphasising the relative importance of livestock production. The production of biogas is also an important activity of many farms in the region (Regionale Planungsgemeinschaft Altmark 2012).

### **8.3 Historical Circumstances That Have Shaped the Farming System**

The farming system in the Altmark is still shaped by structures created with the agricultural policy measures of the former Democratic Republic of Germany (GDR) and by spatial and social marginalisation processes resulting from the societal transformation in the aftermath of Germany's reunification. In the 1950s and 1960s, private family farms were transformed into state-managed agricultural production cooperatives (Landwirtschaftliche Produktionsgenossenschaft, LPG). The collectivisation process established very large farms of pooled land as well as large herd sizes. During this time, the region saw a specialisation in arable farming and in livestock production. Agriculture in the late GDR was characterised by low productivity due to lack of modernisation and investment in the final years of the by-then almost bankrupt GDR. At the same time, 11 per cent of the workforce was employed in agriculture in 1989, compared to just 3.5 per cent in Western Germany. In the Altmark, even every fourth to fifth employee worked in the agricultural sector (Bernien 1995).

After German reunification, farmers had the opportunity to reclaim their land, but only a small number decided to become independent entrepreneurs. Due to their lack of capital and knowledge on how to individually manage a farm, many farmers pooled their returned land

and other resources to re-establish cooperative farms. In addition, a number of local farmers and many external investors established limited liability companies. The farming system managed to successfully adapt to the sudden integration into the Common Agricultural Policy of the European Union. Both cooperative and corporate farms adjusted quickly to the new political and economic conditions. They achieved a remarkably rapid increase in productivity mainly due to mechanisation, the reduction of workforce, and an increased application of chemical inputs. In other sectors, the transformation in the Altmark was not as efficient. In many villages and entire regions, the LPG was the only employer and often responsible for communal and social roles like running nurseries or fire departments (Weiß and Corthier 2016). The privatisation of the LPGs left a large void in both the employment and the municipal service structure. Lower wage levels compared to urban areas, few opportunities for career advancement, poor infrastructure, and lack of employment opportunities contributed to a large population exodus post-reunification. Particularly well-educated young women turned their backs on rural areas (Weiß and Corthier 2016). This outmigration and the general demographic change led to a decline of 13 per cent in the Altmark's population since reunification. Today it is one of the least densely populated regions in Germany. This, in turn, makes attracting young people one of the most challenging tasks for the region (Michaelis 2009). The ageing and declining population also affects the farming system since farms find it difficult to attract and retain a skilled staff (*Learning Interviews*).

## 8.4 Characteristics and Associated Challenges of the Farming System

### 8.4.1 *Agro-ecological Factors*

The Altmark region does not offer the best environmental conditions for agriculture: poor soils (sandy or clay rich) and low average annual rainfall limit agricultural productivity. Historically, weather challenges such as floods and droughts have been recurrent. However, in recent years, the farming system in the Altmark has been repeatedly affected by an increasing occurrence of extreme weather events such as frost, drought, heavy rain and floods. After extremely dry summers in 2018 and 2019, all participants in the stakeholder workshop *FoPIA*

*II* were concerned about the future climatic conditions for agriculture in the Altmark. The application of pesticides and other chemical inputs has negative impacts on the biodiversity and natural habitats in the region. Another problem is that many water channels and extraction rights for irrigation water date back to the pre-reunification period. The outdated extraction rights mean that access to water is unequally distributed and some farms have insufficient access (Bijttebier et al. 2018; Unay-Gailhard et al. 2018). Not only the quantity, but also the quality of water is expected to become a problem because of a structural shift in dairy production. While the number of smaller dairy farms in the Altmark is continuously decreasing, especially during periods with low milk prices, medium and large-scale dairy farms are becoming the dominant form of dairy production in the region. Some interviewees of the *Farm Demographic Interview* stated the concern that this might lead to an increase of water pollution in the region.

#### 8.4.2 *Agro-economical Characteristics*

Although growth could be seen in other economic sectors such as the food industry, energy production, and wood processing (Schmidt 2010), agriculture is still relatively important in the Altmark. It accounts for 5 per cent of gross value added in the Altmark region, compared to 0.9 per cent for Germany as a whole in 2018 (Statistikportal 2019). However, the weak capital base per hectare, the high share of rented land in large farms, the low proportion of high-quality arable land, and the reliance on hired labour, which is often not available constrain agricultural productivity and make the farming system vulnerable. In the *FoPIA II* workshop, as in all previous stakeholder discussions, there was a broad consensus that market prices for agricultural products would remain low whilst costs increase. In this context, creating value-added opportunities was mentioned several times as a response, but no strategic approaches were suggested. Most farms focus on primary production; meaning there is not a clear avenue for increasing value-added through product differentiation. Direct marketing was regarded as a difficult undertaking in the Altmark because of the weak demand in the region. Generally, participants in the *FoPIA II* workshop saw an urgent need to adapt the farming system to increase the market power of farmers. Several external economic factors that influence the resilience of agriculture

in the Altmark were discussed by the participants in the *FoPIA I* workshop. For instance, the 2008 financial crisis led to strongly fluctuating market prices of agricultural products which, according to participating farmers, had negative impacts on their business. Another example was the introduction of minimum wages in Germany in 2015. The minimum wage improved farm workers' livelihoods but put more pressure on the farms' financial profitability. In the *Farm Demographic Interviews* farmers mentioned competition with foreign producers as an economic challenge. Simultaneously, rising land prices further challenge the system.

### 8.4.3 Institutional Embedding

In the *Risk Management Focus Group* as well as the *Learning and Farm Demographic Interviews*, farmers mentioned policy makers not paying enough attention to farmers' needs, continuously changing political regulations, and increasing bureaucratic requirements as challenges for the resilience of the farming system. Similarly, in the *FoPIA II* workshop, the effect of policies and regulations was generally seen as ambivalent, particularly when they change frequently. Some group members invoked the ideals of a free market and self-regulation and saw overregulation as a risk for system efficiency. Others did not share this view and highlighted the protective and supportive roles of policies and regulations. The impact of the political framework on the farming system was further assessed by applying the *ReSAT* tool (see Chapter 4). Direct payments from the Common Agricultural Policy (CAP) of the European Union provide buffer resources to stabilise farm incomes and thereby support the status quo of the farming system. Therefore, the current policy constellation strongly enhances the robustness of the farming system. The European Agricultural Fund for Rural Development (EAFRD) programming of the state Saxony-Anhalt within the 2nd pillar of the CAP focusses on objectives which address challenges for the medium to long term such as protection of agricultural resources. But it suffers from a limited budget, as Germany transferred only 4.5 per cent of the 1st pillar budget into the 2nd pillar (European regulations would have allowed a 15 per cent transfer). A key problem, however, seems to be that these voluntary measures were taken up by fewer addressees than expected. Participants in all research activities during the SURE-Farm study in the Altmark

highlighted the poor infrastructure in the region as a key challenge for the farming system. The low levels of internet coverage, access to financial services, availability of medical and care services, cultural offerings, and commuting possibilities reduce the attractiveness of living in the Altmark. In the *FoPIA II* workshop, these issues were assessed as already being beyond their critical thresholds. As a response, some farmers fulfil municipal tasks which are no longer sufficiently provided by the municipality (Weiß and Corthier 2016).

#### 8.4.4 Social Environment

Participants in the different SURE-Farm research activities repeatedly highlighted that a bad image of agriculture has contributed to the unattractiveness of the sector. Many participating farmers stated that the media had played a central role in transmitting a negative picture of conventional farming to the broader society. Moreover, participants saw little contribution from society to the farming system's resilience in the form of, for example, supporting rural life or improving natural capital. In addition to economic challenges and the low level of rural development, the negative reputation of agriculture was seen as a major factor for the limited availability of workers and farm successors.

### 8.5 Impact of the Challenges on Essential System Functions

Each farming system fulfils a number of essential functions which can be divided into the provision of public and private goods (Chapter 1; Meuwissen et al. 2019). Stakeholders' perceptions of the importance and performance of the farming system functions in the Altmark were assessed in the *FoPIA I* workshop. The functions which were regarded as most essential concern both private and public goods (see Annex 8.1). While farmers scored the importance of the function 'economic viability' as highest, non-farmer participants such as politicians and NGO representatives attributed most importance to the function 'food production'. While the importance of these two functions was scored highest, the actual performance was assessed as low to medium for the function 'economic viability' and as moderate to good for the function 'food production'. Regarding public goods, the function 'maintaining

natural resources in good condition' was perceived as most important by all stakeholder groups and its performance was assessed as moderate to good. One main finding is that while the function 'quality of life' was perceived as important, its performance scored lowest and therefore requires particular attention.

All of these essential system functions are directly shaped by several of these challenges, showing a high degree of complexity of the factors that affect resilience (for a detailed discussion, see Mathijs et al. 2021). Most notably, the experiences of extreme weather events in 2018 and 2019 exposed the vulnerability of agriculture and its most essential functions such as the 'production of food' and the 'conservation of natural resources'. Once the function of 'food production' is affected by extreme weather events, this spills over to the function of 'economic viability' of farms. Both functions are affected by issues of continuously changing policies and regulations, which were seen as making long-term planning for improved risk management and innovations more difficult for farm owners and managers. Furthermore, the functions 'food production' and 'economic viability' of farms are also affected by the shortage of labour supply due to the unattractiveness of the region. Finally, the various negative effects of the low level of rural development and infrastructure provision in the Altmork directly affect the system functions 'quality of life' and 'attractiveness of rural areas'.

## 8.6 Resilience Capacities and Attributes of the Farming System

The SURE-Farm methodological framework (Chapter 1; Meuwissen et al. 2019) conceptualises resilience attributes and capacities. Understood as the 'individual and collective competences and the enabling (or constraining) environment' (Meuwissen et al. 2019), resilience attributes provide conditions for the resilience of a farming system and its capacities. In the present case study, during different research activities, participants assessed resilience attributes in the Altmork as generally low to moderate. The manifestation of the attributes is directly shaped by the systems' characteristics and challenges described in the previous sections. In the *FoPIA I* workshop, the participants assessed the 'functional diversity' of the farming system to be low. This is mainly due to the poor soils which limit the diversity

in arable farming. Mixed farms with a diverse production system show a higher degree of functional diversity. The diversity of the systemic responses to shocks and stresses was estimated by participants as moderate to good. While mixed farms were generally seen to have a greater set of responses, for all farm types diversification into other on-farm activities such as biogas or tourism was regarded as feasible. The *Learning Interviews* revealed a moderate to good level of ‘openness’ of the farming system. Learning was seen as potentially contributing to resilience by learning from others, acquiring information, implementing best practices from colleagues or cooperating with other farmers (experimenting, sharing inputs). Interviewees reported that learning strategies (e.g. experimentation, learning from others, acquiring new information, and reflexivity) enabled them to adopt better risk management strategies and thereby improve resilience. Regarding agricultural practices, ‘system reserves’ were seen to be at a low level. In several workshops, participating farmers described their low equity base as a main challenge for their farms (see Section 4.2). In addition, given the described societal and institutional characteristics, human capital is low (labour and succession). Yet, agricultural practices were strengthened by a moderate to good level of ‘natural capital’ and coupling good farming practices with it. However, there is a risk of deterioration of the natural capital due to climate change, and the loss of water quality and biodiversity. Regarding farm demographics, levels of diversity and modularity are low. Farmers reported difficulties in attracting the young generation and women (reducing diversity), and skilled labour in general (limiting modularity). Governance measures were perceived as not being responsive enough to system challenges and were ranked low to moderate in *FoPIA I*, indicating a low level of the resilience attribute ‘tightness of feedback’. In contrast, the ‘tightness of feedback’ was assessed as good among farmers but the perceived low level of institutional support or institutionalisation of exchange activities was a major finding of *FoPIA II*.

The resilience framework suggests three capacities which a given farming system needs to develop or strengthen in order to achieve resilience: robustness, adaptability, and transformability. In the *FoPIA I* stakeholder workshop, participants were asked to assess these three capacities for the farming system in the Altmark. All three resilience capacities were estimated by workshop participants to be

generally low to moderate in the Altmark. At the time of research, adaptability was perceived as the strongest among them, mainly because of the farms' ability to increase their efficiency, a good level of self-organisation of farmers, and the potential to diversify their activities. After the farming system went through a transformation from a socialist to a market economy after the German reunification, the analyses of the SURE-Farm research activities provide little evidence on whether the current system is able to apply its past capacity to transform to the current challenges.

### 8.7 Future Strategies to Enhance Resilience of the Farming System

Future strategies were discussed with farming system stakeholders in the *Risk Management* and *FoPIA II* workshops. The characteristics and challenges, and the farming systems' functions and attributes presented here provide a sound base for reflecting on appropriate strategies to enhance the resilience of the farming system in the Altmark. Strategies target all four interwoven processes of the adaptive cycle: risk management, governance, farm demographics, and agricultural production (see Chapter 1; Meuwissen et al. 2019). Concerning *risk management*, the low economic capital of farms as well as farmers' perceptions to be at or even beyond a threshold (*FoPIA II*) demonstrate a clear need to increase the financial security of farms. During the *Risk Management* focus group, participants expressed the necessity to improve the information flow within the system, particularly with regard to information on funding opportunities, best practices, and research findings, as well as the handling of regulatory measures. Farmers stated a need to be more appropriately supported by the government (financially and knowledge-wise) during the adaptation and mitigation of climate change effects. In order to better respond to the risk of an acute labour shortage, participants suggested farmers should increase their investment in training and education of potential workers. Regarding *governance* processes, the challenges arising from what were seen as continuously changing policies and regulations were often mentioned. Future strategies should therefore consider the medium- and long-term planning needs of farming system stakeholders. Similarly, high bureaucratic barriers were deemed to reduce

farmers' ability to adapt or even transform. Participants suggested to take addressees' experiences with legislation and bureaucracy more into consideration when developing public policy. *FoPIA II* participants saw public support of societal appreciation of agriculture as another important governmental strategy which would improve the resilience of the farming system. The joint implementation of projects which aim to educate the public about agriculture was seen as a strategy to enhance the attractiveness of agriculture as an employer.

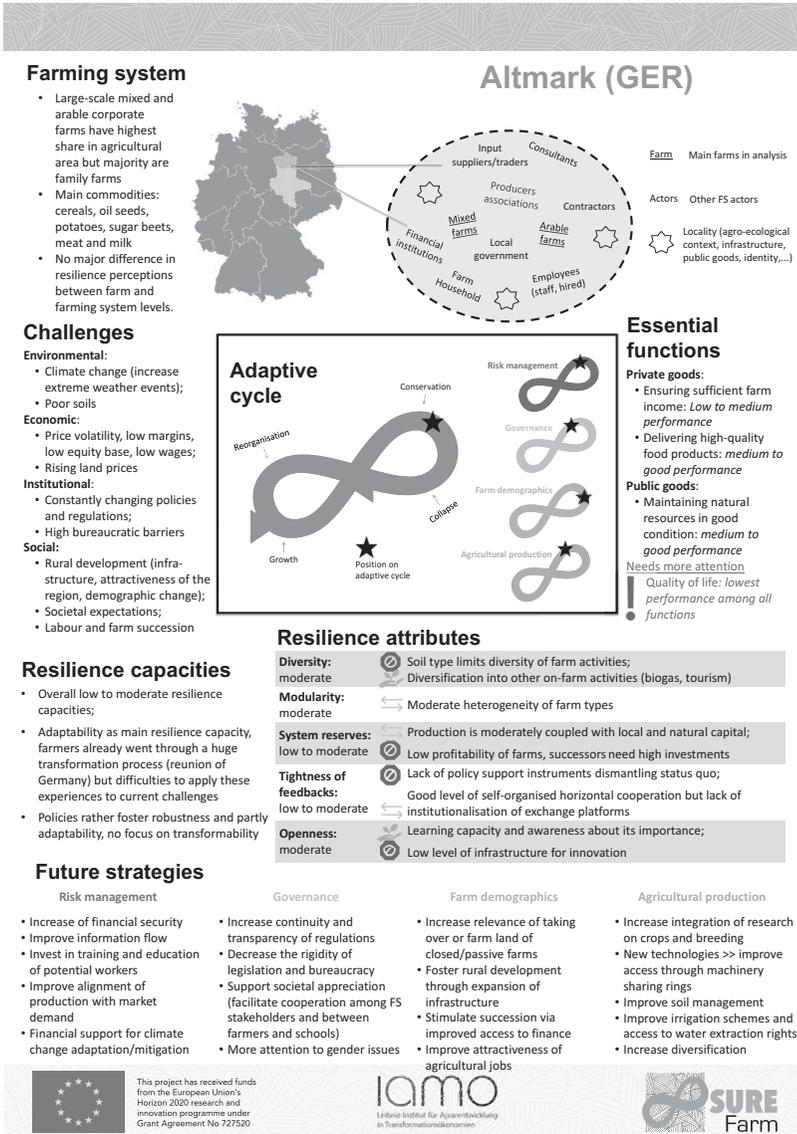
As the findings reveal, *farm demographics* are under particular pressure in the Altmark. The low level of rural development, negative demographic change, and high investment needs are the main obstacles for this process. Consequently, resilience-enhancing strategies have to address these factors. While several infrastructure projects are ongoing, the progress is slow and participants in the various focus groups have not yet experienced any positive effects of these projects. The increase in the Federal State's efforts for a dedicated encompassing development strategy, targeting infrastructure deficits (mobility, communication, social services) in the rural areas of the Altmark would have a positive effect on most of the resilience attributes and can therefore be seen as a key strategy to enhance the resilience of the system. Measures which improve the stimulation of succession (e.g. through improved access to finance) or which enhance the attractiveness of agricultural jobs (e.g. through higher wages, a more positive social reputation) were seen as feasible. In addition, the transfer of farm land of closed or closing farms to existing or new farms will also gain more importance in the future since likely more farms will exit.

One key strategy concerning *agricultural production* which was brought up by participants in the *Risk Management* focus group was improved integration of research findings in production activities. In order to do so, research findings would have to be more easily accessible and new channels of information flow would need to be established either by the research organisations, farmers' groups, or with public support. Farms' adaptation of new technologies is a strategy which responds to several challenges by, for instance, adapting to climate change, improving soil management, and increasing farm efficiency. Machinery rings reduce costs for farmers and foster cooperation between and self-organisation among farmers. In the *FoPIA II* workshop the participants stated that if water in the Altmark were to

become scarcer, not only more efficient irrigation systems would be needed but also the production would have to be adjusted to the new climate conditions. An increased functional diversity of farms would foster resilience at the farm level and then at the farming system level. As there is currently an increase in demand for organic and local products in Germany, a potential transformation to organic farming was discussed as one alternative system in *FoPIA II*. While the main changes would occur at the farm level and mainly affect production methods and plant and animal varieties used, a number of changes in both upstream and downstream segments would also be required since the inputs would change and new marketing channels would need to be established. However, most of the participating conventional farmers showed a rather sceptical attitude towards a transition to organic farming.

## 8.8 Conclusion

The profitability of farms is low, the natural capital soil is relatively well conserved but biodiversity and habitats are decreasing. Maintaining sufficient water qualities and quantities are possible future challenges arising from climate change and intensification of dairy production. The availability of labour and successors is limited due to low profitability, negative societal reputation of the sector, and general demographic trends. The structural marginalisation of the Altmark, regarding lack of social and cultural opportunities, internet, and transport connections to the next metropolitan areas, further adds to the low standard of living in the region and reduces the attractiveness of farming there as well. Overall, the farming system of the Altmark was assessed as adaptable and also robust in particular processes, but also as experiencing a lock-in due to low wages and insufficient infrastructure. Consequently, transformability of the farming system was considered to be low. Strategies to enhance the resilience of the farming system should address all four processes in the adaptive cycle – risk management, governance, demographics, and production practices – with particular emphasis on rural development and fostering exchange between all farming system stakeholders in order to develop joint strategic approaches, and to improve spreading of information and best practices.



**Annex 8.1** Factsheet synthesising resilience of the current farming system in the Altmark (Germany).  
 Source: own compilation

## References

- Accatino, F.; Paas, W.; Herrera, H.; Appel, F.; Pinsard, C.; Shi, Y. et al. (2020): Impacts of future scenarios on the resilience of farming systems across the EU assessed with quantitative and qualitative methods. SURE-Farm Deliverable 5.5. Paris: INRAE. Available at [www.surefarmproject.eu/wordpress/wp-content/uploads/2020/06/D5.5.-Future-scenarios-on-the-FS-resilience.pdf](http://www.surefarmproject.eu/wordpress/wp-content/uploads/2020/06/D5.5.-Future-scenarios-on-the-FS-resilience.pdf), last accessed on 17 March 2021.
- Bernien, M. (1995): Umbruch der Arbeit in der Landwirtschaft der neuen Bundesländer. In R. Schmidt, B. Lutz (Eds.): *Chancen und Risiken der industriellen Restrukturierung in Ostdeutschland*. Wiesbaden: VS Verlag für Sozialwissenschaften (KSPW: Transformationsprozesse), pp. 356–374.
- Bijttebier, J.; Coopmans, I.; Appel, F.; Gailhard, I.; Wauters, E. (2018): Report on current farm demographics and trends. SURE-Farm Deliverable 3.1. Melle: OCILVO. Available at [www.surefarmproject.eu/wordpress/wp-content/uploads/2019/05/D3.1-Report-on-current-farm-demographics-and-trends-RP1.pdf](http://www.surefarmproject.eu/wordpress/wp-content/uploads/2019/05/D3.1-Report-on-current-farm-demographics-and-trends-RP1.pdf), last accessed on 17 March 2021.
- Coopmans, I.; Desein, J.; Bijttebier, J.; Antonioli, F.; Appel, F.; Berry, R. et al. (2019): Report on a qualitative analysis in 11 case-studies for understanding the process of farm demographic change across EU-farming systems and its influencing factors. SURE-Farm Deliverable D3.2. Melle/Halle: OCILVO/IAMO. Available at [www.surefarmproject.eu/wordpress/wp-content/uploads/2019/07/D3.2-Report-on-a-a-qualitative-analysis-in-11-case-studies-for-understanding-the-process-of-farm-demographic-change-across-EU-farming-systems-and-its-influencing-factors.pdf](http://www.surefarmproject.eu/wordpress/wp-content/uploads/2019/07/D3.2-Report-on-a-a-qualitative-analysis-in-11-case-studies-for-understanding-the-process-of-farm-demographic-change-across-EU-farming-systems-and-its-influencing-factors.pdf), last accessed on 17 March 2021.
- Mathijs, E.; Bijttebier, J.; Accatino, F.; Feindt, P.; Gavrilescu, C.; Manevska-Tasevska, G. et al. (2021): Report on combinations of conditions for successful and unsuccessful fostering of resilience in agricultural sectors. SURE-Farm Deliverable 6.2. Melle: OCILVO. Available at [www.surefarmproject.eu/wordpress/wp-content/uploads/2019/07/D3.2-Report-on-a-a-qualitative-analysis-in-11-case-studies-for-understanding-the-process-of-farm-demographic-change-across-EU-farming-systems-and-its-influencing-factors.pdf](http://www.surefarmproject.eu/wordpress/wp-content/uploads/2019/07/D3.2-Report-on-a-a-qualitative-analysis-in-11-case-studies-for-understanding-the-process-of-farm-demographic-change-across-EU-farming-systems-and-its-influencing-factors.pdf), last accessed on 17 March 2021.
- Meuwissen, M.; Feindt, P.; Spiegel, A.; Termeer, C.; Mathijs, E.; de Mey, Y. et al. (2019): Framework to assess the resilience of farming systems. In: *Agricultural Systems* 176.
- Michaelis, D. (2009): Die Altmark – eine Kulturlandschaft im Spannungsfeld von Schrumpfung, Chancen und Visionen. In R. Friedel, E. A. Spindler (Eds.): *Nachhaltige Entwicklung ländlicher Räume. Chancenverbesserung*

- durch Innovation und Traditionspflege*. 1. Aufl. Wiesbaden: VS Verlag für Sozialwissenschaften, pp. 398–404.
- Paas, W.; Accatino, F.; Antonioli, F.; Appel, F.; Bardaji, I.; Coopmans, I. et al. (2019): Participatory impact assessment of sustainability and resilience of EU farming systems. SURE-Farm Deliverable D.5.2. Wageningen: WU. Available at [www.surefarmproject.eu/wordpress/wp-content/uploads/2019/06/D5.2-FoPIA-SURE-Farm-Cross-country-report.pdf](http://www.surefarmproject.eu/wordpress/wp-content/uploads/2019/06/D5.2-FoPIA-SURE-Farm-Cross-country-report.pdf), last accessed on 17 March 2021.
- Pitson, C.; Appel, F.; Dong, C.; Balmann, A. (2019): Open-access paper on the formulation and adaption of an agent-based model to simulate generational renewal. SURE-Farm Deliverable D3.4. Halle (Saale): IAMO. Available at [www.surefarmproject.eu/wordpress/wp-content/uploads/2019/05/D3.4-Paper-on-adapting-an-ABM-to-simulate-generational-renewal.pdf](http://www.surefarmproject.eu/wordpress/wp-content/uploads/2019/05/D3.4-Paper-on-adapting-an-ABM-to-simulate-generational-renewal.pdf), last accessed on 17 March 2021.
- Regionale Planungsgemeinschaft Altmark (2012): Wieder erfolgreich im Bundeswettbewerb: Die Altmark ist Bioenergie-Region. Available at <http://altmark.eu/bioenergie-region>, last accessed on 17 March 2021.
- Schmidt, U. (2010): Gleichwertigkeit der Lebensbedingungen im ländlichen Raum – das Beispiel Altmark. In M. Rosenfeld (Ed.): *Gleichwertigkeit der Lebensverhältnisse zwischen Politik und Marktmechanismus. Empirische Befunde aus den Ländern Sachsen, Sachsen-Anhalt und Thüringen*. Hannover: Akad. für Raumforschung und Landesplanung. Arbeitsmaterial der ARL, Nr. 351, pp. 220–236.
- Soriano, B.; Bardaji, I.; Bertolozzi, D.; San Martin, C.; Spiegel, A.; Slijper, T. et al. (2020): Report on state and outlook for risk management in EU agriculture. SURE-Farm Deliverable D2.6. Madrid: UPM. Available at [www.surefarmproject.eu/wordpress/wp-content/uploads/2020/02/D2-6-Report-on-state-and-outlook-on-risk-management-in-EU.pdf](http://www.surefarmproject.eu/wordpress/wp-content/uploads/2020/02/D2-6-Report-on-state-and-outlook-on-risk-management-in-EU.pdf), last accessed on 17 March 2021.
- StaLa-Statistisches Landesamt Sachsen-Anhalt (2008): Agrarstrukturerhebung Teil 3: Betriebswirtschaftliche Ausrichtung, Standarddeckungsbeiträge, sozialökonomische Verhältnisse der landwirtschaftlichen Betriebe. Halle (Saale). Available at [www.stala.sachsen-anhalt.de/download/stat\\_berichte/6C404\\_4j\\_2007.pdf](http://www.stala.sachsen-anhalt.de/download/stat_berichte/6C404_4j_2007.pdf), last accessed on 17 March 2021.
- (2014): Ausgewählte Merkmale der landwirtschaftlichen Betriebe nach Kreisen 2013. Halle (Saale). Available at [www.stala.sachsen-anhalt.de/Internet/Home/Daten\\_und\\_Fakten/4/41/411/41121/Ausgewaehlte-Merkmale-nach-Kreisen-2013-.html](http://www.stala.sachsen-anhalt.de/Internet/Home/Daten_und_Fakten/4/41/411/41121/Ausgewaehlte-Merkmale-nach-Kreisen-2013-.html), last accessed on 17 March 2021.
- Statistikportal (2019): Volkswirtschaftliche Gesamtrechnungen der Länder. Bruttoinlandsprodukt, Bruttowertschöpfung in den kreisfreien Städten und Landkreisen der Bundesrepublik Deutschland 1992 und 1994 bis 2018 (2). Available at [www.statistikportal.de/de/vgrdll/ergebnisse-kreise](http://www.statistikportal.de/de/vgrdll/ergebnisse-kreise)

[bene/bruttoinlandsprodukt-bruttowertschoepfung-kreise#alle-ergebnisse](#), last accessed on 27 November 2020.

- Unay-Gailhard, I.; Balmann, A.; Appel, F. (2018): Dimensions of SURE-Farm farm typology for farm resilience assessments. SURE-Farm Deliverable D1.3. Halle (Saale): IAMO. Available at [www.surefarmproject.eu/wordpress/wp-content/uploads/2019/05/D1.3-Farm-Typology-RP1.pdf](http://www.surefarmproject.eu/wordpress/wp-content/uploads/2019/05/D1.3-Farm-Typology-RP1.pdf), last accessed on 17 March 2021.
- Urquhart, J.; Accatino, F.; Appel, F.; Antonioli, F.; Berry, R.; Bertolozzi, D. et al. (2019): Report on farmers' learning capacity and networks of influence in 11 European case studies. SURE-Farm Deliverable D2.3. Gloucestershire: UoG. Available at [www.surefarmproject.eu/wordpress/wp-content/uploads/2019/07/D2.3-Report-on-farmers-learning-capacity-and-networks-of-influence.pdf](http://www.surefarmproject.eu/wordpress/wp-content/uploads/2019/07/D2.3-Report-on-farmers-learning-capacity-and-networks-of-influence.pdf), last accessed on 17 March 2021.
- Weiß, W.; Corthier, J. (2016): Beitrag der Landwirtschaft zur Sicherung der Daseinsvorsorge in ländlichen Räumen. In M. Herbst, F. Dünkel, B. Stahl (Eds.): *Daseinsvorsorge und Gemeinwesen im ländlichen Raum*. Wiesbaden: Springer, pp. 127–149.