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Farm abandonment consequences: Insights from German farm advisors impacting farms and rural areas

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ABSTRACT

Farm succession can be a challenge for continuity, often leading to abandonment in the absence of a successor. This study investigates the relationship between farm abandonment and succession based on 46 qualitative interviews with agricultural advisors from three German regions. The aim is to uncover the reasons for abandonment, changes in farm management and associated consequences, providing insights into the phenomenon of farm abandonment. The analysis findings contribute to the understanding of the implications for farms and rural areas. This provides valuable insights into identifying effective strategies for maintaining the sustainability of the farming sector and preserving the attractiveness of rural areas.

Keywords*: Farm succession; farm abandonment; structural change in agriculture; expert interviews.*

1 Introduction

The most noticeable trend of structural change in European agriculture in recent decades has been the reduction in the number of farms, accompanied by an increase in size and specialisation among the remaining farms (Neuenfeldt et al., 2019). In Germany, this transformation is viewed with social and political scepticism (Deutscher Bundestag, 2018; ZKL, 2021). The decrease in the number of farms is attributable to numerous factors, with biological, technological and organisational progress standing out as the most visible causes (Tweeten, 1984; Buchenrieder et al., 2007). However, generational renewal on farms also directly influences structural changes in agriculture (Corsi et al., 2021). If there is no suitable successor on the farm at the time of handover, its abandonment is often considered part of the retirement transition and is subsequently carried out (Schmitt and Gebauer, 1987; Breustedt and Glauben, 2007; Corsi et al., 2021). The 2020 agricultural census revealed that only 50% of farm managers of sole proprietorships aged 55 years and above had a potential farm successor, with agreed successions even lower at 36.7% (Destatis, 2021a). Although these statistics are based only on the self-assessment of farm managers over 55 years of age, the figures indicate that a considerable number of farms are unlikely to be passed on to the next generation, which may result in farm closures.

Previous studies have indicated that uncertain farm succession poses a challenge for existing agricultural structures (Chiswell, 2014; Burton and Fischer, 2015; Zagata and Sutherland, 2015). Most of these studies have primarily focused on factors that influence farm succession, such as farm and family characteristics, and have analysed different determinants and their impacts on the probability and resolution of farm succession (e.g. Stiglbauer and Weiss, 1998; Tietje, 2004; Mann and Rossier, 2007; Lobley et al., 2010; Baker et al., 2013; Cavicchioli et al., 2018; Mair and Bitsch, 2018; Feil and Ester-Heuing, 2019; Coopmans et al., 2021). However, limited attention has been paid to the consequences of a lack of farm succession.

A review of the current literature provides incomplete insights into the issue of agricultural farm abandonment, leaving pertinent questions unanswered regarding the consequences of farm abandonment, reasons behind the decision and associated changes at the farm level. This paper examines the phenomenon of farm abandonment, defined as discontinuation of farm management by either the farm manager or a potential farm successor, with other farms utilising specific resources of the abandoned farms, such as renting the farmland. The objective of this investigation is to analyse the consequences of farm abandonment on farms and rural areas by examining the underlying causes and changes in farm management beforehand. This research is particularly crucial in light of the ongoing structural changes in agriculture. It raises the question of how the resources of abandoned farms are reused and how farm operators manage and handle their decisions. We also study the effects of farm abandonment on people living in rural areas and their communities. Understanding the consequences and their potential positive and negative effects is crucial for identifying appropriate solutions and strategies for the expected transformation of the agricultural sector.

A qualitative research approach, based on 46 expert interviews with agricultural advisors, explores the issues surrounding farm abandonment. These advisors support farmers during the process and typically accompany multiple farm transfers and abandonments every year. Their task is to support clients in discovering pragmatic solutions, which allows them to share their collected experience in interviews. This approach provides valuable insights into the reasons, processes and outcomes of farm abandonment and farm succession. Insights from farm advisors in the farm abandonment process enhance comprehension and establish a robust foundation for future investigations.

The paper is structured as follows. First, the conceptual framework of farm abandonment is introduced, situating the research questions and objectives within the broader theme of this framework. Second, the research materials and methods are described. Third, the results of the interviews are presented and discussed, and the main takeaways are summarised.

2 Conceptual and Theoretical Framework of Farm Abandonment

Farm abandonment directly impacts structural changes in agriculture, necessitating the examination of this concept within the context of evolving farm structures. A framework derived from existing literature defines three stages of the farm abandonment process (see Figure 1) to structure the research and illustrate potential cause-and-effect mechanisms.

2.1 Structural changes in agriculture

Structural changes in German agriculture manifest through various factors, such as the declining number of farms, coupled with an increase in individual farm sizes. The pace of these changes, tracked through statistical farm counts, exhibits temporal and regional variations, showing deceleration. From 1999 to 2020, the total number of German farms with farmland of at least 5 Ha decreased by 32%, with varying rates of decline in East and West Germany due to their

different historical growth structures. In East Germany, where larger farms are prevalent, the number of recorded farms remained stable. In contrast, West Germany experienced an annual decline of 2.6% between 1999 and 2010, followed by a slower decline of 1.3% between 2010 and 2020 (BMEL, 2023).

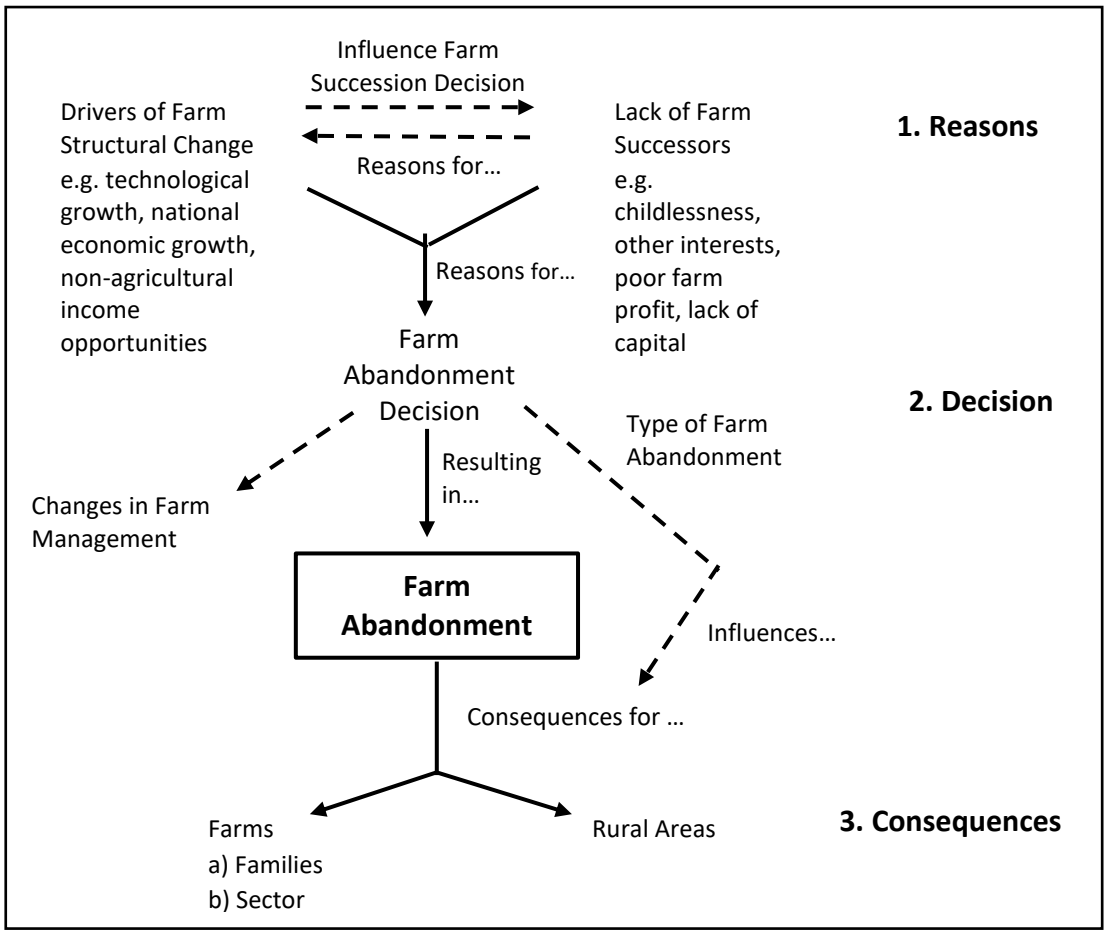

Figure 1. Framework to examine different aspects of farm abandonment in the context of farm structural changes.

Various theories have attempted to explain structural changes in agriculture, yet there is no consistent and comprehensive explanatory model (Forstner et al., 2018). In particular, the economic theory of farm households focuses on decision-making units within households that dictate resource distribution. It involves comparing potential non-agricultural earnings with agricultural profits while considering opportunity costs (Schmitt and Gebauer, 1987). This theory delves into the efficiency of small-scale structures, drawing on transaction cost economics (Mann, 2003). In contrast, the theory of path dependency posits that small-scale agricultural structures are inefficient (Mann, 2003), emphasising the significance of initial farm production structures for further development (Balmann et al., 2006; Forstner et al., 2018). Additionally, the technological treadmill theory highlights the continual decrease in agricultural prices due to technological advancements (Cochrane, 1958; Arbuckle and Kast, 2007), impacting farms that are unable to keep pace with the changes. Push and pull factors contribute to outward migration from agriculture, with pull factors from non-agricultural sectors and push factors from more efficient farms displacing less efficient ones. While these theories address causes and decision-making in agricultural operations from an economic perspective, they fall short in comprehensively addressing farm abandonment and its consequences. Therefore, it is necessary to consider additional factors such as human influences and unexpected events.

2.2 Reasons for farm abandonment

Farm abandonment is influenced by factors categorised under human capital, farm structure, structural environment and socioeconomic considerations (Ferjani et al., 2015). In the context of farm abandonment, human capital involves socio-demographic factors, such as the age of the farm operator, education level and the presence of a successor (Kimhi and Bollmann, 1999; Hofer, 2002; Gale, 2003; Bragg and Dalton, 2004; Mann and Rossier, 2007; Zorn and Zimmert, 2022). Farm structural factors that contribute to farm exits include farm size, percentage of rented land, production

direction and farming intensity (Kimhi and Bollmann, 1999; Hofer, 2002; Glauben et al., 2003; Ferjani et al., 2015; Zorn and Zimmert, 2022). Structural environment factors include the unemployment rate, population density and regions facing disadvantages (Weiss, 1999; Hofer, 2002; Rossier and Wyss, 2006). Socioeconomic elements refer to income sources within and outside of agriculture, as well as subsidies, such as those provided by the European Union's Common Agricultural Policy (Hofer, 2002; Mann, 2003; Bragg and Dalton, 2004; Breustedt and Glauben, 2007). These factors are consistent with the literature on the determinants of agricultural structural changes. In addition to economic and technological factors (Tweeten, 1984; Buchenrieder et al., 2007), structural changes are also driven by higher productivity, a lack of political direction, globalisation, climate change and evolving societal expectations (Schmitt and Gebauer, 1987; WBAE, 2018; Neuenfeldt et al., 2019; Nowack et al., 2019; WBAE, 2020; Corsi et al., 2021; ZKL, 2021).

This research focuses on farm abandonment caused by a lack of succession, emphasising the withdrawal of entire farms when no successor is available (Schmitt and Gebauer, 1987; Breustedt and Glauben, 2007; Corsi et al., 2021). Conversely, structural changes may deter potential successors from pursuing alternative paths outside agriculture (Tietje, 2004; Almeida and Zylbersztajn, 2017). Current statistics show that only 37% of sole proprietorships in Germany, whose farm managers are at least 55 years old, have a secure farm succession. As almost half (47%) of the farm managers belong to this group, major structural changes can be expected in the coming years (Destatis, 2011a, 2011b, 2021a, 2021b).

2.3 Farm abandonment decision

Depending on the circumstances, farm abandonment exists in various forms, such as voluntary versus involuntary farm abandonment and planned versus sudden occurrences (Bentley and Saupe, 1990; Kimhi and Bollmann, 1999; Gale, 2003; Breustedt and Glauben, 2007). Most abandonments are voluntary, often tied to retirement, with other reasons such as health concerns, death or limited occupational mobility also contributing (Bentley and Saupe, 1990; Gale, 2003). Forced abandonments due to bankruptcies, which draw attention from the media and policymakers, are characterised by financial strain involving dept, diminishing net cash farm income and overall household income (Gale, 2003; Breustedt and Glauben, 2007), often linked to inadequate farm management abilities (Goddard et al., 1993). Such financial strain is less common among older farm operators compared to their younger counterparts, who often rely on debt financing for business development (Gale, 2003).

The timing of the decision to leave the farm is pivotal to determining the nature of farm abandonment. Voluntary exits are typically preplanned, while sudden closures may result from poor farm performance (Kimhi and Bollmann, 1999) or unforeseen events such as accidents, illness or divorce. The outcomes of different abandonment types vary. Chances of farm management preceding abandonment, influenced by the type of abandonment, include workload reduction or a transition to a more extensive or downsized approach (Potter and Lobley, 1996). This trend applies to both voluntary and planned abandonments, whereas sudden abandonments may lack prior preparation.

Changes in farm management, not a direct consequence but a decision, are a crucial element of the fam abandonment process and included separately in this study. This aspect should not be disregarded, especially considering its relatively unexplored nature until now.

2.4 Consequences of farm abandonment

The consequences of farm abandonment extend beyond the agricultural sector, affecting the social, environmental and economic domains for both active and inactive stakeholders. This research focuses on the impact of farm abandonment on farms and rural areas.

Previous studies have mainly focused on the implications for farming resources, often redirecting to other agricultural establishments (Breustedt and Glauben, 2007). Previous research explored land abandonment, which involves land no longer in use and has both positive and negative consequences (Filho et al., 2017; Li and Li, 2017; Subedi et al., 2022; Pawlewicz and Pawlewicz, 2023). Filho et al. (2017) highlighted the impact of farm abandonment on traditional farming, leading to a decline and homogenisation of landscape structures (Subedi et al., 2022). Social consequences include the loss of farming knowledge (Subedi et al., 2022) and village outmigration in pursuit of different lifestyles and better income opportunities (Breustedt and Glauben, 2007; Baumann et al., 2011). Positive environmental impacts, such as revegetation (Filho et al., 2017) and enhanced habitat availability, have also been noted (Subedi et al., 2022).

3 Materials and Methods

This study adopted a qualitative research approach, employing semi-structured expert interviews to gain a comprehensive understanding of farm succession and abandonment. Qualitative research, recognised for its inductive nature (Röben and Wetzel, 2016), aids in exploring these phenomena within the context of lack of farm succession and their potential interconnections. This study focuses on an exploratory investigation aligned with its research objective.

Expert interviews, classified into central roles in research design, were selected as the primary data collection method. This research falls into the category where experts play a central role in data collection, utilising their expertise in farm succession and abandonment as the foundation. The interviews aimed to analyse the structure and connections of expert knowledge, requiring an empirical analysis with a categorial frame as a reference (Meuser and Nagel, 1989).

Farm advisors, chosen as experts due to their diverse specialisations and roles in institutions providing farm succession advice, bring extensive professional experience to the study. Their frequent encounters with farm transfers and abandonments equip them to share accumulated knowledge and offer insights into common and unique challenges. Situated in rural regions, these advisors provide a more complete perspective on farm transfers and abandonment processes, directly experiencing the consequences. However, despite their involvement, the experts often lack an insider's viewpoint, relying on observable factors. Therefore, close cooperation with the affected farmers is crucial for accurate assessments.

3.1 Selection of experts

The experts were selected through a two-stage thematic sampling process based on geographic criteria and the focus of their advice. The research covered the German federal states of Baden-Württemberg, Mecklenburg-Western Pomerania and Lower Saxony, taking into account their regional structural, economic, legal and historical differences. The selection criteria included variations in farm size, agricultural inheritance law, geographical conditions and the likelihood of obtaining farm successions, as outlined in Table 1.

Mecklenburg-Western Pomerania, being a constituent state of East Germany after the Second World War and joining the Federal Republic of Germany after the reunification in 1989, differs in agrarian structures due to its unique historical background. Baden-Württemberg in southern Germany is known for its diverse yet small-scale agricultural structures, influenced by traditional inheritance procedures resulting in smaller farm sizes. In contrast, Lower Saxony, located in the north of Germany, follows a distinct agricultural inheritance system where farms tend to be inherited in entirety without any division among family members.

Table 1.
Selection characteristics of the interview regions in 2020 (own calculation, based on Destatis, 2021a, 2021c)

Decisive factors	Baden-Württemberg	Mecklenburg- Western Pomerania	Lower Saxony	Germany
Geographical position	South	East	North-West	-
Total number of farms	39,090	4,780	35,350	262,780
Average farm size (ha)	36	280.8	72.7	63.2
Proportion of full-time farms among sole proprietorships (%)	35.4	44.5	53.9	43.5
Inheritance law	Regional agricultural inheritance laws ('Anerbenrechte')	German Civil Code (BGB)	Agricultural inheritance law ('Höfeordnung')	-
Probability of secured farm successions	30.22	30.30	37.24	36.67

This selection allowed the coverage of farm succession and abandonment situations for various agricultural holdings in Germany, aiming to encompass different farm types and inheritance laws.

The second step involved selecting experts from diverse professional backgrounds related to farm succession and abandonment advice. The expert group comprised general professionals and specialists in socio-economic matters, business management, legal and tax affairs and other fields. To gain an initial understanding of farm succession and abandonment circumstances, we interviewed general professional advisors, primarily employed with professional agricultural associations. These associations, often the initial point of contact for such advice, resulted in general advice dominating the interviews. As a second category, the socioeconomic specialists were addressed. This type of advice, dispensed by state and church establishments, differs in terms of the focus on the socioeconomic facets of farm transfers and abandonments. To supplement the collected data with varied expertise, interviews were conducted with farm management, tax and legal advisors as well as banking professionals and rural associations (categorised as 'other' in Table 2). When interviewing experts, it is crucial to consider their background and potential biases, particularly when dealing with interest groups, to avoid conveying the group's interests and departure from reality. Statements must always be assessed within the proper expert context.

To minimise the result discrepancies, a blend of diverse expert groups was selected. Table 2 presents the total number of interviews, classified by the region of interviews and the subject area.

A total of 46 interviews were conducted, with recruitment stopping at theoretical saturation, indicating no new insights from additional interviews (Bertolozzi-Caredio et al., 2020).

While the number of interviews was almost equal in Baden-Württemberg and Lower Saxony, Mecklenburg-Western Pomeranian had fewer interviews due to the smaller number of farms and advisory services. However, this number was considered adequate compared to the farms in that region. The experts approached, particularly those from the field of general and socio-economic advice, were generally receptive. It proved more challenging to obtain information from the other advisor groups, particularly those not dealing with farm transfer or abandonment daily or focusing on peripheral aspects of these themes.

Table 2.
Overview of the composition of the expert interviews.

Advisory areas	Baden-Württemberg	Mecklenburg-Western Pomerania	Lower Saxony	Total
General (professional/ farming associations)	10	4	11	25
Socio-economic (state, church)	5	1*	4	10
Management (chamber of agriculture, private)	2	1	2	5
Tax and legal (private)	1	1	1[a]	3
Other (banks, rural association)	0	2	1	3
Total	18	9	19	46

* Two interviewees in one interview situation

3.2 Interview process

The consultants were contacted through email and telephone and received written information on the interview topics well in advance. With one exception, all interviews were conducted online through Webex; technical issues necessitated one in-person interview. All interviews were recorded and transcribed. Most interviews were one-on-one, but in two cases, the interviewee brought a colleague. The interviews took place from January to April 2022, each lasting between 34 and 76 min.

The interviews began with questions about the interviewees' expertise and their vision for the future of agriculture. Subsequently, the discussions focused on farm succession in the experts' locality, exploring the factors that influence succession decisions. This initial conversation framed subsequent discussions on farm abandonment within the context of succession. The section on abandonment started by investigating the reasons for the decision to abandon and the typical exit process, followed by the consequences of farm abandonment, including the fate of farms, their assets and employees. It also included the impact of closure on farm managers, the sector and rural areas. A final question addressed challenges during the exit process. The interview concluded with a question about the involvement of new entrants in the context of farm abandonment, with an opportunity for supplementary remarks.

All interviews were conducted in German. Quotations, used to emphasise statements in the Results section, were translated into English based on their meaning, rather than a literal translation.

3.3 Data analysis

The interviews were analysed with qualitative content analysis (Mayring and Fenzl, 2019) using MAXQDA software. Deductive codes, predetermined based on existing literature (see Coopmans et al., 2021), which directed the interview guide's development, were progressively assigned to the interview content. Inductive codes emerged during the analysis, often leading to the creation of subcategories for more specific content descriptions under deductive codes. The primary results of each subcategory were condensed.

The focus of the data analysis centred on responses related to farm abandonment, exploring changes in farm management post-decision; utilisation of land, buildings and employees after abandonment; and effects on farm managers, rural areas and the agricultural sector, along with potential post-abandonment issues. The impacts were later grouped into those for farms and rural areas.

Additionally, the subcategories were compared to draw conclusions regarding the potential importance, considering the number of experts discussing each topic, their advisory focus and the three regions in which the interviews were conducted. Data triangulation was employed by comparing the interview findings with relevant literature.

4 Results and Discussion

This section presents and discusses the findings from expert interviews, triangulated with relevant literature, offering insights into farm abandonment from the perspective of farm advisory services. The frequency of mention is included to indicate the relevance of the statements. While the exact frequency cannot be determined with this qualitative approach, a tendency in statement importance can be indicated.

The section begins with the analysis of the causes of farm abandonment, followed by an investigation into changes in farm management practices from the decision to quit farming to the actual abandonment event. Subsequently, the outcomes of farm abandonment on both the farms and the surrounding rural areas are outlined. This involves evaluating the ongoing use of land, buildings and employees, analysing the impact on former farm managers and identifying other significant factors. The findings are presented for each of the three interview regions, although detailed differentiation was not always feasible. If experts from one federal state mentioned aspects more or less often than those from the other two regions, this is indicated in the results. If the consequences were mentioned equally often, no distinction is made between the regions. Finally, limitations are addressed, and key aspects of this research are critically examined.

4.1 Reasons for farm abandonment

To analyse the consequences of farm abandonment, the reasons cited by the experts were first identified as a basis for evaluating potential outcomes. The interview findings and literature review revealed that the effects of farm abandonment stem from various factors in addition to the absence of successors, primarily driven by structural changes (e.g., Weiss, 1999; Breustedt and Glauben, 2007; Corsi et al., 2021). Past research projects have explored factors influencing both farm succession and farm abandonment, with many demonstrating similar effects, either favouring or opposing these processes, given their close connection (Glauben et al., 2003).

Figure 2 presents the interview findings on the causes of farm abandonment, organised by the frequency of reasons cited. Six reasons were identified, with the economic and income situation of farms and families being the most frequently mentioned, as highlighted by 50% of the experts. This is consistent with the findings of Bragg and Dalton (2004) and Möllers and Fritzsch (2010), who discovered that non-profitable farms are more likely to exit. Another reason for farm abandonment is lower income compared to non-farming sources (Bragg and Dalton, 2004). The duration of time spent on farming can also impact the economic situation, with inconsistent findings on the effect of full-time and part-time farming on the likelihood of leaving farming (Kimhi and Bollmann, 1999; Weiss, 1999; Breustedt and Glauben, 2007; Möllers and Fritzsch, 2010; Ferjani et al., 2015).

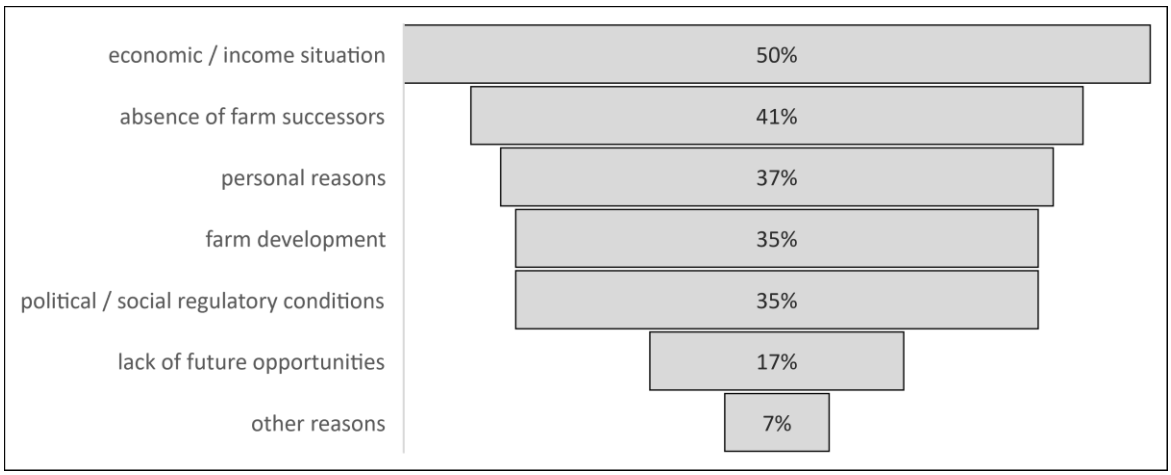

Figure 2. Reasons for farm abandonment identified in the expert interviews (by frequency of mention in %, n = 46).

The second most cited reason for farm abandonment was the lack of farm successors, followed by personal reasons related to family matters. The literature supports these findings, indicating that a farm manager's agricultural education reduces the likelihood of exiting (Weiss, 1999; Breustedt and Glauben, 2007), while general education increases the possibility (Weiss, 1999). Gender and age demographics were found to have only a small impact (Griffin et al., 2019).

Other reasons mentioned by the experts included the farm's past development and potential for future growth. Past farm expansion decreased the likelihood of farm abandonment (Weiss, 1999; Breustedt and Glauben, 2007). Meanwhile, farm size was found to be negatively correlated with abandonment (Kimhi and Bollmann, 1999; Weiss, 1999; Breustedt and Glauben, 2007; Ferjani et al., 2015).

A factor identified in contrast to the previous literature was the impact of political and regulatory conditions, as well as future prospects. In the interviews, the farm's location was noted as one of the 'other' reasons, with exit probability increasing in more densely populated regions (Weiss, 1999; Cavicchioli et al., 2018).

Determining the precise causes of farm abandonment and assessing outcomes can be challenging due to the unique circumstances of each farm and the multiple interacting variables that influence the owner's decision. It is assumed that farm abandonment due to reasons other than farm succession has similar consequences, as most abandonments result from a combination of factors rather than a single cause.

4.2 Changes in farm management in the course of farm abandonment

When farms undergo prolonged abandonment rather than abrupt cessation, observable changes in farm management serve as early indicators of the impact of abandonment. Potter and Lobley (1996) introduced the 'retirement effect', indicating that farmers without successors disengage by reducing landholdings and production intensity.

The expert interviews corroborated these findings, highlighting frequent discussions on downsizing farms. The experts discussed general reductions, including farm size and a shift towards extensive farming. Specific changes in farm management, particularly regarding livestock, land, workload and buildings, were also emphasised. Some experts suggested that farm transition to part-time operations could be an intermediate step towards abandonment, potentially leading to downsizing. Changes were noted in investment behaviour, with decreased investment volumes and prolonged use of existing equipment. However, certain experts noted no alterations in the management practices of farmers planning imminent retirement. They indicated that existing farming structures persist until the period of abandonment approaches. Table 3 summarises the interview outcomes regarding the modifications in farm management.

Table 3.
Changes in farm management during farm abandonment

Category of changes in farm management practices (Frequency of mention in %, n = 46)	Subcategory	Main changes in farm management practices
Downsizing of the farm (65%)	General reduction (43%)	• Reduce the size of the farm as much as possible while still being able to manage the work, even in retirement. • Extensification of the farm to reduce the workload. • The farm slowly disintegrates
	Livestock (41%)	• Reduce livestock. • Exit from livestock farming. • Transition to extensive livestock farming.
	Farmland (19%)	• Leased land is returned. • Owned land will be leased. • Focus on arable farming.
	Vol. of work (4%)	• Outsourcing of (especially labour-intensive) work.
	Buildings (2%)	• Buildings are partly rented out.
Investment behaviour (54%)		• Little or no investment is made. • Current equipment, including technology, is maintained. • New purchases of equipment are avoided.
No/hardly any changes (15%)		• There are no plans for the future of the farm. • The structures on the farm will remain in place until the farm is abandoned.
Transition to part-time farming (13%)		• As a transitional measure to farm abandonment • This process involves various facets of farm downsizing.

4.3 Consequences and impacts of farm abandonment

This subsection delves into the effects of farm abandonment on both farms and rural areas. The consequences were identified using interview data, and the resulting impacts were inferred for these two areas. The data collection focused on the ongoing utilisation of land, buildings and employees, as well as the effects on farm managers and other stakeholders.

Table 4 outlines the evolving outcomes of farm abandonment, both advantageous and disadvantageous, on farms and rural areas. Further detailed explanations and analyses of specific aspects are presented in the subsequent subsections.

Table 4.
Consequences of farm abandonment for farms and rural areas based on the perceived impacts in expert interviews

Effects of certain areas of farm exit	Consequences identified in the expert interviews (Frequency of mention in %, n = 46)		Derived impacts for farms	Derived impacts for rural areas
Further use of buildings	Decay and vacancy	63%	Financial burden of maintenance of the buildings	Aesthetic burden for the landscape
	• Further use • *Conversion* • *Continued use* • *For sale*	93% *76%* *59%* *37%*	Potential for farm growth of the remaining farms	Creation of living spaces, settlement of other industries, e.g. crafts
Further use of land	Fallow land	2%	-	-
	Further use • *Renting to other farms* • *Selling*	89% *74%* *30%*	Farm growth of the remaining farms ➔ Increased probability of farm succession	Continued food production Undesirable enlarged landscape structures
Further employment of employees	Employment inside or outside of agriculture	37%	Counteracting the shortage of skilled labour in agriculture	Counteracting the shortage of skilled labour outside of agriculture
Farm managers' handling of farm abandonment	Emotional / psychological impacts ➔ *Later liberating / relieving effect*	70% *26%*	Psychological sense of failure / loss of family tradition	-
	Inadequate retirement provision	11%	Risk of old-age poverty	-
Other effects	Alienation of agriculture and society	44%	Loss of acceptance of agriculture	Loss of knowledge about food production and agricultural processes
	Decrease in volunteers	30%	-	Lack of engagement in the villages
	Undesirable changes in village structure	13%	-	Changes like loneliness or ageing
	Dwindling political influence of agriculture	11%	Less political advocacy for agriculture	-

4.31 Further use of buildings

All experts emphasised the reuse of agricultural buildings. The conversion of farm structures, particularly in cases of serve decay or permanent vacancy, was a recurrent theme. In Mecklenburg-Western Pomerania, the experts noted the common vacancies in farm building, attributing the limited conversion options to the absence of alternative uses in the rural setting of the state. One consultant expressed his concerns, stating

> *'With stables and the buildings, it is sometimes a real tragedy. I have learnt that I can put any other animal in a cow shed. No problem at all. […] But you can't put a cow in a henhouse and you can't put a cow in a pigsty. [...] And now there are barns that are ten, 15 years old. They could actually still be used. Some of them even have debts to be paid. They remain empty. So there really are ruins.'* (MV 1)

In the other two regions, the experts frequently discussed building refurbishment, particularly in urban areas. The primary aim was often to create living spaces, storage facilities or event locations to benefit localities. Abandoned buildings, especially when vacancies are prolonged, have a negative visual impact on the countryside (Schmied, 2007).

Moreover, they pose financial challenges for farm owners due to ongoing maintenance costs (Schmied, 2007). Nevertheless, experts from all three regions unanimously agreed that well-maintained buildings are regularly repurposed for both agricultural and non-agricultural uses, such as leasing or purchasing.

4.32 Further use of land

The majority of respondents (89%) acknowledged the continued use of agricultural land. Only one adviser mentioned that certain areas with specialised crops, such as vineyards, might be left uncultivated if conversion to arable land is challenging. Renting land is particularly important for preserving assets within farming families, compared to selling. Rental income also serves as an important source of income for former farm managers, contributing to their livelihood and retirement provision. Additionally, leasing facilitates passing the land to the grandchildren's generation.

Sales were more frequently mentioned in Mecklenburg-Western Pomerania, contrasting with the scarcity discussed in Lower Saxony. This disparity is attributable to Mecklenburg-Western Pomerania's unique history, marked by the establishment of numerous farms following German reunification. Unlike the former Federal Republic of Germany, where farm ownership often had a deep familial history, the attachment to farms in Mecklenburg-Western Pomerania may be less rooted, leading to a greater consideration of selling the farm.

An interviewee summarised the prevailing form of land use, stating

> *'With land, it is simply rented out, […] there are farms that close their barn door, which stop. And the other farms, want to continue to develop and grow, so land is not really a problem for us'.* (BW1)

This observation aligns with Pawlewicz and Pawlewicz's (2023) research, indicating Germany's resilience against land abandonment. Regardless of whether the land is sold or leased, the continuity of food production is assured. Breustedt and Glauben (2007) affirmed changes in land use when farms close, resulting in fewer but larger farms offering growth opportunities for receiving farms:

> *'The land continues to be used, the production continues to take place, and of course this always offers opportunities for the remaining farms to expand. Of course, it is also always an opportunity for the remaining farms to improve their structures […] through the consolidation of the farmed areas'*. (BW9)

Extensive research has supported the positive correlation between farm size increase and the likelihood of farm succession in subsequent generations (Stiglbauer and Weiss, 1998; Fasterding, 1999; Glauben et al., 2005; Mann and Rossier, 2007; Lobley et al., 2010; Cavicchioli et al., 2018), corroborated by relevant statistical data (Destatis, 2021a).

However, the societal view of landscape structure alterations due to farm expansion is unfavourable. The topic of farm structural changes, though briefly discussed in all federal states, is most prevalent in Mecklenburg-Western Pomerania.

4.33 Further employment of employees

The continuity of farm workers' employment emerged as a discussion point in the interviews, but its relevance varied across the three regions. In Baden-Württemberg, where farms are smaller and have fewer external staff or none, the issue of retaining employees does not arise in cases of farm abandonment. However, it was more frequently highlighted in the other two regions. According to the experts, farm abandonment does not result in unemployment for workers; instead, they often secure employment elsewhere, either within or outside the agricultural sector. Farm abandonment might even contribute positively to Germany's skilled labour shortage as former farm workers or potential farm successors transition into alternative industries.

4.34 Effects on former farm managers

The primary repercussions for farm managers, according to experts, manifest in emotional and psychological challenges. This is often linked to the disappointment of discontinuing their life's work, the farm, and breaking the tradition of a family-run enterprise. Ex-farm managers commonly experience sorrow, a sense of failure and a loss of purpose, especially if the farm held a central role in their lives (Peel et al., 2016). An advisor encapsulated these effects, stating

> *'For those involved, it is of course also a great psychological burden, often connected with the fact that I am the failure in the family who stops here, who no longer carries on the legacy of the generations before me'*. (BW15)

The prevalence of these effects was higher in Baden-Württemberg than in Mecklenburg-Western Pomerania, but lower in Lower Saxony. This difference is likely due to the distinct historical context. In Mecklenburg-Western Pomerania, many farms were established as legal entities after 1989 and typically lack a strong family connection or tradition. Additionally, only a few farms have been abandoned to date.

However, some advisors noted a feeling of relief or liberation after leaving the farm, though often with a time lag. Groier (2004) supported this, reporting that despite a painful conclusion, there is often a sense of relief and positive aspects associated with the new phase of life. An expert explicitly stated,

> *'But most people are relatively free at some point when they have given up or decided to do so. At least, if it is well planned financially, it works'.* (NI15)

Less frequently mentioned in the expert interviews was the impact of farm abandonment on farm managers' retirement provision. Old-age poverty may result if the income from renting or selling the farm, including the agricultural land, is insufficient to cover the cost of living or if the former farm manager is unable to find other employment due to illness or old age. In the case of farm succession, the next generation typically secures the livelihood of the elderly by making payments to them. However, this option is excluded in the case of farm abandonment.

4.35 Other impacts

The alienation of agriculture from society, attributed to farm abandonment and the decline in the number of farms, emerged prominently in the interviews. This lack of understanding about the origin and production processes of agricultural products could lead to disputes, complicating acceptance. Land abandonment, as noted by Subedi et al. (2022), causes a loss of knowledge about farming activities. Groier's (2004) study underscored the importance of farms providing knowledge about agricultural practices, particularly for children who interact with animals and participate in outdoor education.

Expert discussions also addressed the decline in the number of civil society volunteers due to reduced farmer participation resulting from farm abandonment. Although village volunteering involves various individuals, farmers stand out for their on-site presence during the daytime. They contribute to activities such as aiding the fire brigade or enabling village events through their machinery. These findings are consistent with those obtained by Steinführer (2015), who indicated that the importance of farms for individual and collective services of general interest has decreased due to structural changes in agriculture. The impacts on village structure, including growing rates of loneliness and an ageing population, were highlighted in the interviews. Breustedt and Glauben (2007) and Subedi et al. (2022) aligned with these findings, associating rural depopulation with farm loss.

These aspects were more frequently mentioned by experts from Lower Saxony, particularly in rural areas. One expert summarised these effects, stating

> *'Many farmers are always active on a voluntary basis, in many organizations, be it politics, [....] I think something would be missing in the village, and if it were to reduce to just a few people, I think that would be a loss for the quality of life'.* (NI9)

A few experts, especially from Lower Saxony, cited the declining political weight of agriculture as a factor affecting rural areas. This is manifested in the decreasing consideration of their interest in political decisions. Coleman (1999) argued that, as structural changes continue, the political impact diminishes when the voting power of farmers and their direct representation decrease. The long-term impact may not be immediately apparent, but the interviews suggested potential issues if experts' voices are excluded from agricultural decision-making. Ultimately, note that the standard of representation may not necessarily deteriorate post-farm abandonment; it has the potential to develop in a more formal way if, for example, a farmer with greater expertise succeeds their predecessor.

4.4 General remarks

This research primarily explores the consequences of farm abandonment while highlighting the challenges associated with discontinuing farming. The experts highlighted difficulties in the farm abandonment process, emphasising the need for clarity on legal and organisational aspects during farm closure or when transferring inactive farms to future generations (SVLFG, 2013). Tax considerations were frequently mentioned as a potential concern, though the author finds it debatable whether a high tax burden is problematic given the high value of the assets.

Effective planning for farm abandonment, considering the unique characteristics and circumstances of each farm, is important, in which the different types of farm abandonment, as discussed in Section 2.3, play a significant role. Long-term planning for farm transfer, if decided early by prospective successors, can prevent problems (SVLFG, 2013; ZKL, 2021; LWK Niedersachsen, 2023). However, not all potential consequences can be avoided through long-term planning, as emotional responses cannot be entirely suppressed.

This study's findings contribute to a broader understanding of the consequences of farm discontinuation, encompassing associated difficulties and issues. While some of these findings are in agreement with existing knowledge, the study also provides new insights. Notably, agricultural employees frequently find employment elsewhere, addressing labour shortages within or beyond the agricultural industry. However, former farm managers may face inadequate retirement provisions following farm abandonment. Farm closure contributes to the alienation of agriculture from society, a topic previously explored mainly in the context of the loss of social functions within communities through children's experiential learning. Additionally, the decline in the number of farmers due to farm abandonment has resulted in fewer community volunteers in rural areas, impacting village structures. Furthermore, the reduced influence of agriculture in politics is observed as a consequence of farm abandonment. These findings offer valuable insights into the multifaceted

impacts of farm abandonment, expanding the comprehension of its consequences beyond the current research literature.

4.5 Limitations

The presented data exclusively represent the perspective of agricultural advisors, excluding viewpoints from other societal groups or farmers themselves. Despite this limitation, the insights from farm advisors are deemed valuable for addressing the research objective, given their concentrated knowledge of farm abandonment situations and broader understanding beyond individual cases (see Chapter 3).

The findings suggest that farm abandonment outcomes are not solely linked to the absence of farm successors but are common across various farm abandonment scenarios. This complexity arises from the impacts of structural changes on potential successors, influencing their decisions regarding farm takeovers. Consequently, addressing the consequences of farm abandonment due to a lack of farm succession must be approached in a more general sense, emphasising the intricacy of the issue and the challenge of precisely identifying contributing factors. Despite these limitations, objectivity in addressing the question of farm succession is crucial, given its significance in public debates, and is cited as a primary reason for farm abandonment (Weiss, 1999; Breustedt and Glauben, 2007; Glauben et al., 2006; Corsi et al., 2021; Margarian, 2010).

Although this research primarily focuses on the impact of farm abandonment on farms and rural areas, it may also affect other sectors and communities. However, due to the limited expertise of farm advisors, who mainly focus on farms and rural areas, this research cannot thoroughly investigate the consequences beyond these domains, neglecting the potential impacts on non-agricultural sectors and urban areas.

Finally, presenting results by interview region only indicates tendencies and relative frequency in each region. A quantitative study could provide more precise insights into the occurrence and prevalence of these consequences within single regions, as well as for farm abandonment in general.

5 Conclusion

This research offers insights into farm abandonment and analyses its causes, changes in farm management and the resulting outcomes. The study focuses on the impact of farm abandonment on abandoned and remaining farms, as well as rural areas, in three German federal states. The results indicate some regional differences, particularly in relation to the rural character of Mecklenburg-Western Pomerania. However, the differentiation among the regions was only possible to a limited extent and requires further research.

Farm abandonment is a complex issue that is influenced by various interconnected factors. It can be intentional and planned, or it can be forced and unplanned due to sudden events such as accidents, illnesses, death or economic failure. This research identifies the main reasons for farm abandonment, with the financial and income situations and lack of farm succession being the most frequently cited by the surveyed experts. The consequences of farm abandonment cannot be easily categorised by cause, as the decision to close a farm is often influenced by multiple interrelated factors. Once the decision to abandon the farm is made, affected farms often downsize or shift towards extensive farming, reducing investment. This typically results in irreversible changes that make the farm unattractive for future succession.

Although farm abandonment can present challenges for the farming family, it also creates opportunities for others and contributes to structural changes through growth and diversification of agriculture. Surrounding farms can benefit from cultivating abandoned land, using existing buildings, and in some cases, filling an existing labour shortage. This can enable them to secure the future of their farms, so one's loss can be another's gain. Chiswell and Lobely (2015) argued that a certain degree of abandonment is necessary to facilitate the development of other farms and create opportunities for new entrants. From a sectoral perspective, the impact on food production is not yet relevant.

Based on the opinions of the surveyed agricultural advisors, farm abandonment in rural areas is causing an increasing knowledge gap in terms of the origin and production of food, leading to increasing alienation between agriculture and society. This issue is prevalent in urban regions and may also affect rural regions as farms continue to decline. To address this problem, it is important to connect people with agriculture. Establishing measures such as school lessons or kindergarten visits to farms, leisure activities in agriculture or internships could counteract the declining interest in agriculture. Another possibility is the changed use of land, for example, through community-supported agriculture, which allows people to participate in agriculture. According to Curtiss et al. (2022), consumer participation in agriculture can increase recognition and appreciation of the sector, fostering a relationship of solidarity between the rural population and farmers. Appropriate measures need to be implemented and evaluated for their effectiveness.

Regarding future developments, it is necessary to determine whether there is a specific need for action from advisory services and policymakers to address existing problems and opportunities related to farm abandonment. Although the number of farm abandonments has decreased significantly in the past decade, with an annual decline rate of only about

1.3%, a massive decline in farm numbers is not anticipated (BMEL, 2023). The significant rise in land and real estate prices presents an opportunity to pay off existing debts or generate alternative income when agriculture and livestock farming are abandoned. As a result, it is unlikely that serious financial difficulties will occur after farm abandonment.

Starting points for supporting farm abandonment can include providing socioeconomic advice to families who struggle to give up their farm due to emotional reasons, which can lead to negative consequences for animals, the environment and employees. Given the increasing mechanisation and professionalisation in agriculture, as well as challenges in animal welfare, climate protection and biodiversity, farm managers are advised to consider a timely and well-planned abandonment. Qualified institutions should strengthen their advisory services and promote their use by farms and families. These issues should be considered in light of the growing physical and mental strain that numerous farm managers and their families face (SVLFG, 2023).

Further research is required to gain a comprehensive understanding of farm abandonment, as this study only focuses on its impact on farms and rural areas. Other perspectives, such as those from municipalities and farmers, should be included in future studies. Additionally, the impact on other sectors and communities should be analysed. The consequences by frequency could be categorised in a quantitative study. In addition, studying farm succession, especially those involving non-family successors, provides insights into the challenges associated with farm abandonment.

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Appendix

Table A1.
List of quotes

Abbreviation	Federal state	Consulting focus
MV 1	Mecklenburg-Western Pomerania	General consulting
BW1	Baden-Württemberg	General consulting
BW9	Baden-Württemberg	General consulting
BW15	Baden-Württemberg	Socio-economic consulting
NI15	Lower Saxony	Management consulting
NI9	Lower Saxony	General consulting

Table A2.
Interview Guide**.**

Content of the interviews:

The objective of the expert interviews is to examine the consequences of a shortage of farm successors. The interview starts by discussing the present situation of farm succession in the region where the experts are based, followed by an examination of reasons behind both successful and unsuccessful farm transfers. Subsequently, the factors that lead to farmers abandoning their farms are identified, and the consequences of such occurrences are examined with a focus on their effects on farms, rural areas, and the wider agricultural industry. The interview questions pertain primarily to family farms that are operated as sole proprietorships or partnerships (mostly GbRs).

Introductory questions:

(1) In which region do you offer advice? Is there any connection with farm succession?
(2) Could you outline the different farm types, typical size and legal structure in your region?
(3) What's your perspective on the future of farming and farmers?

Main questions:

(1) Farm succession situation
    a. Can you explain the farm succession situation in your association area?
        i. Are there any variations? E.g. operational size, company success, etc.
    b. Who will be taking over the farms?
    c. Which farm succession formats are used in your region?
    d. How do you evaluate the succession situation on farms, both for individual companies and for the agricultural industry as a whole?
    e. Do you think there is a link between farm succession and changes in the structure of agriculture?
(2) Decision for or against farm succession
    a. What types of farms are most frequently transferred and which types of farm are less frequent transferred?
    b. What motivates young farmers or heirs to take over farms?
    c. Why do young people decide against working in agriculture or taking over a farm?
    d. What influence do farm managers have in the successors' decision to take over the farm?
    e. At what point will the joint decision on farm succession be made and how final is the decision?
(3) Farm abandonment
    a. Why do farmers leave agriculture?
    b. Does the method of management alter if a farm is certain to be annulled? If so, how?
    c. What happens to farm factors such as land, buildings and employees?
    d. What consequences do farm abandonments have on farm managers, the agricultural sector and rural areas?
    e. Are you aware of any particular difficulties that arise from farm abandonment, especially due to a lack of farm successors?

Final questions:

(1) In the absence of successors, what role do new entrants play?
(2) Would you like to add any information that you believe is pertinent to the subject matter?