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Article

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Agricultural Professionalization of Austrian Family Farm Households – the Effects of Vocational Attitude, Social Capital and Perception of Farm Situation

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Abstract

Household strategies of farming families refer to the medium to long-term orientation of the farm operation. They also constitute the goal and the framework for entrepreneurial behavior and reflect the living concept of the farming family as well as the operative processes of adapting the farm to a changing environment. In this study we explore on the household strategy agricultural professionalization of farmers according to their vocational attitudes, their social capital and their assessments of farming and family resources. A binary logistic regression was applied to data from a survey of 388 farmers in the Austrian district of St. Poelten. The final explanatory model demonstrates that a high level of social capital in family and community in combination with a positive assessment of the survivability of a farm and a positive attitude towards one's vocation render it very likely that plans are made for agricultural professionalization.

Key Words

farm household strategies; agricultural professionalization; family farming; social capital; theory of planned behavior; Austria

1 Introduction

Across the heterogeneity in farm structures as well as in natural, social, economic and political context, family farming is characterized by a close interrelationship amongst family, farm operation and household. The family members, often from more than two generations, do not only form a biological and social unit; they also form a type of living, working and economic community. The ownership and management of the business assets is in the hand of the family, providing the main labor and capital to the farm operation. Family farming is also associated with family values, tradition, intergenerational care, and farm succession influencing decision making of the farm household (e.g. BJORKHAUG, 2012; DAVIDOVA and THOMSON,

2014; FAO, 2014). Due to the complex relationships and interactions amongst family, farm operation and household, the long-term existence of a family farm is based on a subjective rational balance between family interests and the requirements of the farm operation. This balance is not static; instead it must be repeatedly re-established due to changing conditions, e.g. agricultural and environmental policy, economic framework, social expectations, as well as changing requirements and needs of the family members in the course of the family life cycle. For the farming family, this means that their household strategy, which is the medium to long-term orientation of the farm operation, must be repeatedly reconsidered, adapted or replaced by a new strategy. As derived from the literature review, three basic types of household strategies can be distinguished: 1) agricultural professionalization, 2) stable reproduction, and 3) disengagement from agricultural production (e.g. BRUN and FULLER, 1992; JACOBS, 1992; DAX et al., 1993; KNICKEL, 1996; MEERT et al., 2005; KRAMMER et al., 2012; PINTER and KIRNER, 2014).

In this article, based on the example of the household strategy agricultural professionalization, we focus on factors that influence the planned behavior of farming families. As a methodological background for our analyses we draw upon the Theory of Planned Behavior (AJZEN, 1985), a very influential theory to explain behavioral intentions, which, in past decades, was increasingly applied in agricultural studies (e.g. VOGEL et al., 2004; WAUTERS et al., 2010; LAEPPLE and KELLEY, 2013; VIIRA et al., 2014; DONATI et al., 2015; LARCHER et al., 2015; BORGES and LANSINK, 2016).

On this theoretical basis, we analyze survey data on future plans of Austrian farmers regarding the medium to long-term orientation of their farms based on their vocational attitudes, as well as their assessment of farming and family resources. The social integration of the farmers is also considered in the analysis. We aim to contribute to an improved understanding of the complex context that gives rise to the development of household strategies in farm operations, in particular by raising awareness and providing empirical evi-

dence of the importance of attitudes and social capital for household strategies.

The article is structured as follows: in Section 2 we expand upon the theoretical background of family farming and its account in the agricultural sector, on the socio-economic concept of farming family household strategies, on the Theory of Planned Behavior and on the conception of the research model in this study. In Section 3, we introduce the survey area and survey data, the operationalization of the research model and the methods of statistical analysis. In Section 4, we present and discuss the empirical results with respect to influencing factors of agricultural professionalization. In Section 5, conclusions are drawn from the analysis.

2 Theoretical Background and Empirical Framework

2.1 The Importance of Family Farming in the Agricultural Sector

Depending on the database and the definition of family farming, estimated shares of 88% to 98% of the farms worldwide are managed and operated by families. They cultivate 53% to 75% of the agricultural land and count for 53% to 80% of the world's food production (FAO, 2014; GRAEUB et al., 2016). In 2014, the United Nations acknowledged the global importance of family farming to food security, socio-economic sustainability, rural development and environmental protection with the International Year of Family Farming (FAO, 2014). This acknowledgement reflects the shift in the political debate from regarding family farms as part of the global hunger and poverty problem to now addressing them as important factor for its solution. However, the international tribute to family farming also drew attention to its enormous diversity in terms of farm characteristics and regional economic, social and environmental context around the world causing specific challenges for farming families, which call for context-specific and better targeted policy measures (GRAEUB et al., 2016).

In the European Union, about 85% of all agricultural holdings are family farms (defined as farms with sole-holder ownership) accounting for 68% of the Utilized Agricultural Area (UAA) and for 71% of the total Standard Output (SO). Family farms in the European Union are showing an enormous diversity e.g. in terms of farm size, farm labor supply, production branches or degree of market integration and off-farm

activities. The range is from small scale semi-subsistence farms under 5 ha UAA primarily located in the South and South-East of Europe to large scale farms over 100 ha UAA dominating the North-West and the territory of the former communist countries in Central Europe (DAVIDOVA and THOMSON, 2014).

The Common Agricultural Policy (CAP) from its very beginning in the early 1960s declared family farms being its main target group (FENNELL, 1997) and policy measures aimed at increasing agricultural productivity, technological progress, stable agricultural markets and a fair standard of living for farming families through a system of guaranteed prices (MATTHEWS, 2014). Against the enormous public financial outlays resulting from this policy, a continuing reform process started in 1992 (McSharry reform), promoting the concepts of multifunctionality of agriculture in the context of rural development and environmental protection (DE CASTRO et al., 2014). In this post-productive perspective of agriculture, family farms are considered as a key element in fulfilling the objectives of the European Model of Agriculture, identified in 1997: versatility, sustainability, resilience, and competitiveness (DAVIDOVA and THOMSON, 2014). The following four CAP reforms (Agenda 2000, 2003 reform, Health Check 2008 and CAP post-2013) strengthened the role of rural development and of family farming being a critical factor for environmental, economic and social sustainability (DE CASTRO et al., 2014; MATTHEWS, 2014). Although the CAP never has defined family farming precisely nor has designed policy measures for family farms explicitly, it always has influenced household strategies and behavioral intentions of farming families, as explored e.g. by several survey studies in the context of the CAP reform 2003 (TRANter et al., 2007; GORTON et al., 2008; KIRNER and KRAMMER, 2008; MAYE et al., 2009; LOBLEY and BUTLER, 2010; BARNES et al., 2016), the Health Check 2008 (BARTOLINI and VIAGGI, 2013) and the CAP post-2013 (LATRUFFE et al., 2013; DONATI et al., 2015; BARNES et al., 2016) as well as in the context of specific policy measures e.g. EU milk quota deregulation (O'DONNELL et al., 2011; LARCHER et al., 2015) or agri-environmental subsidy schemes (MICHA et al., 2015).

2.2 Household Strategies of Farming Families

The household strategy of farming families refers to the medium to long-term orientation of the farm operation, which simultaneously constitutes the goal and

the framework for entrepreneurial behavior. On the one hand, it reflects the living concept of the farming family and, on the other hand, the operative processes of adapting to changing conditions. Farming families develop their household strategies under the influence of numerous endogenous and exogenous factors. The endogenous factors address the three structural elements forming the family farm system: family members, farm household and farm operation. This group of factors includes family and farming structure, personal capabilities and beliefs, attitudes and preferences of family members, as well as the nature and degree of the emotional connections within the family (e.g. VOGEL et al., 2004; KIRNER, 2005; KIRNER and KRAMMER, 2008; HANSSON and FERGUSON, 2011; HUBER et al., 2015). The exogenous factors refer to the specific social and institutional environments of the farm operation (e.g. social networks with relatives, neighbors and fellow farmers, professional infrastructure and services), technical and/or technological progress, as well as economic and agro-political conditions (e.g. MEERT et al., 2005; BARTOLINI et al., 2014; MERANER et al., 2015).

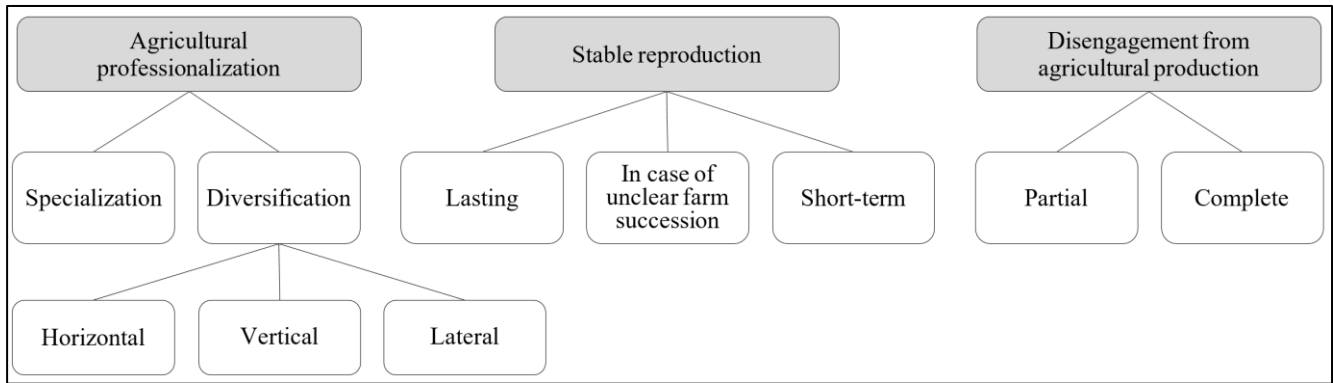
The three already mentioned basic types of household strategies, i.e. agricultural professionalization, stable reproduction and disengagement from agricultural production, can be characterized as follows: farming families, which follow agricultural professionalization as a household strategy, plan the allocation of production means and resources for internal operative activities. Depending on the type of activity, or combination of activities, two forms of agricultural professionalization can be determined: i) specialization and ii) diversification (JACOBS, 1992; DAX et al., 1993; KNICKEL, 1996). Specialization means that a farming family concentrates on one or a few agricultural production branches or sales markets, and expands in this/these field(s). In the case of a diversification, farming families count on expanding a broad scope of farming activities. JACOBS (1992) differentiates between three forms of diversification: in a horizontal diversification, a farming family expands its agricultural production in directly related production branches. A vertical diversification means that pre- or post-production activities are integrated into the agricultural operation (e.g. seed production, processing or direct marketing). Lateral diversification designates the establishment of completely new activities that are not connected to the previous farming production (e.g. holiday quarters on the farm). Conversion to organic farming was originally considered a form of diversification (DAX et al., 1993), but now it is interpreted as

specialization in a specific market segment (HANSSON et al., 2013). An activity cycle can be identified, if the professionalization through specialization or diversification leads to a follow innovation, e. g. an investment in a new livestock housing facility often leads to an investment to enlarge the herd, or a switch to direct marketing often leads to a cooperation with other farmers (LARCHER, 2009; HUBER et al., 2015).

The household strategy stable reproduction is characterized by family farm operations that remain unchanged over time. According to the length and the underlying cause of the static conditions, the following categories emerge: i) lasting stable reproduction, ii) stable reproduction in the case of unclear farm succession, and iii) short-term stable reproduction (PINTER and KIRNER, 2014). The first category represents the maintenance of an ideal farm operation, where everything is running as expected and changes are considered unnecessary (PINTER and KIRNER, 2014). In the case of stable reproduction with an unclear farm succession, changes in farming activities and necessary replacement investments are often neglected due to the uncertain future of the farm operation (LARCHER, 2009). The interrelated stagnation in business development can represent a heavy psychological burden for farming families (GROIER, 2004). Short-term stable reproduction constitutes a limited period in the history of a farm operation, which leaves the future open in all directions: the farming family is in the course of developing a new household strategy and investigating the chances of implementing it or waiting for an external impulse, e.g., agro-political innovations (PINTER and KIRNER, 2014).

The third basic type of household strategy is disengagement from agricultural production. It comprises: i) partial disengagement through extensification of production or out-leasing of fields, and ii) complete disengagement by means of giving up the farm operation. This household strategy is often the result of an illness or retirement of the current farmer in connection with a lack of successor. Bankruptcies of family farms are just as rare in Austria as the sale of the entire farm operation. It is far more frequent, even if the farm operation is discontinued, that the production fields are leased or sold, whereas the family remains living at the site of the farmhouse (LARCHER, 2009). Figure 1 presents an overview of the basic and subsequent types of farm household strategies.

In this article we focus on the household strategy of agricultural professionalization, which is identified if farmers hold one or more of the following plans for specialization or diversification within their medium

Figure 1. Types of farm household strategies

Source: based on literature review (JACOBS, 1992; DAX et al., 1993; KNICKEL, 1996; LARCHER, 2009; PINTER and KIRNER, 2014)

to long-term orientation: i) expansion of agricultural production area, ii) intensification of agricultural production, iii) expansion of direct marketing, and iv) conversion to organic farming. On behalf of the analysis of vocational attitude, social capital and perception of farm situation as factors of agricultural professionalization we want to contribute to an improved understanding of the development of farm household strategies.

2.3 The Theory of Planned Behavior

In their household strategies farming families plan their future behavior – i.e. they make plans to act in a certain way in the future. The Theory of Planned Behavior (AJZEN, 1985, 1988, 1991) is a recognized interdisciplinary theory, which illustrates complex relationships between attitudes and perceptions as well as further behavioral determinants in explaining such behavioral intentions. Behavioral intention is determined by three interactive causal variables. They are: i) the attitude towards the behavior, which includes beliefs like the more or less positive or negative evaluations of one's own behavior, ii) the subjective norm, which represents beliefs of the individual about his/her social circle's expectations regarding his/her own behavior, and iii) the perceived behavioral control, which comprises the individual's beliefs regarding conditions that ease, complicate or limit the respective behavior, e.g., required time or costs (AJZEN 1985, 1991; AJZEN and MADDEN, 1986; MADDEN et al., 1992).

One of the strengths of the Theory of Planned Behavior is that by combining variables from different spheres of influence, such as attitudes, social context and behavioral control, it constitutes a consistent model for explaining planned behavior. Another is that it represents a flexible basic concept, which lends itself

to a great variety of investigations and can be used in combination with other theories (AJZEN, 1985).

A main criticism of the Theory of Planned Behavior is that it does not use the classical socio-psychological concept of attitudes as positive or negative evaluation of objects, but attitudes as evaluation of the own intended behavior or planning structures, i.e. instrumental beliefs (e. g. CARY, 1993). Anyhow, FISHBEIN and AJZEN (1974, 1975) deliberately favored the measurement of attitudes towards the own intended behavior over attitudes towards objects. Their motivation was to measure attitudes on the same level of generality and specificity, which AJZEN (1988) called the principle of compatibility. The aim was to overcome the poor congruence of attitudes and behaviors revealed in an influential meta-analysis of various studies (WICKER, 1969). This principle of compatibility led to a better prediction of intentions and behaviors, but at the expense of assessing cognitive, emotional or conative elements of attitudes towards the object of the behavior in question. In the 1990ies, more contemporary and methodologically more accurate meta-analyses on basis of a greater number of studies showed that the prediction quality of behavior by attitudes towards objects is better than assumed in the 1960ies and 1970ies (SIX and ECKES, 1996). Against this background, in the socio-psychological debate, it was suggested to include such classical elements of attitude measurement into research models on basis of the Theory of Planned Behavior (BAMBERG, 1996).

Therefore, it is not surprising that the basic concept of the Theory of Planned Behavior has repeatedly been expanded over the past 30 years. Specific modification of the basic concept of the Theory of Planned Behavior is also true for its use in studies of farm operations. Attitude towards the behavior, perceived

behavioral control and subjective norm have been adapted to the socio-economic perspective of the agricultural sciences (e.g. WAUTERS et al., 2010; LAEPPLÉ and KELLEY, 2013; BORGES and LANSINK, 2016). Depending on the investigation in question, e.g. psychological concepts such as self-efficacy (JACKSON et al., 2009) or self-image, habit and moral duty (BURTON, 2004) have been integrated. A wide range of additional elements was considered e.g. heterogeneous effects of beliefs (LAEPPLÉ and KELLEY, 2013), past behavior (DONATI et al., 2015; MICHA et al., 2015), perceptions of institutional corruption and economic crisis, future and local characteristics (MICHA et al., 2015), as well as farm and farmer characteristics (VOGEL et al., 2004; DONATI et al., 2015; MICHA et al., 2015). Correspondingly to the individual conceptions, the theory components for empirical surveys have been operationalized in very different ways.

2.4 Conception of the Research Model and Assumptions

In our theoretical model, planned behavior (behavioral intentions regarding the farm operation) represents the dependent variable, which should be explained by causal variables. These are included in our model in the form of the three model components concerning attitude toward the behavior, subjective norm and perceived behavioral control, which means we are adhering to the basic concept of the Theory of Planned Behavior (AJZEN, 1985), in principle. But we also take advantage of the flexibility of this theory for the conception of our research model in the behavioral field of farming families to take consideration of the complex influences on their planned behavior. We thus incorporate the following adjustments in our study:

The model component attitude toward the behavior in our study is recorded on the basis of subjective level of satisfaction with one's vocation as farmer, meaning the general attitude towards farming. This component thus represents an evaluation of the total field of the activity in question, namely farming, where planned behavior is either implemented or not. Regarding planned behavior with respect to intentions for agricultural professionalization, we assume that farmers, who are satisfied with their own vocation as farmer, will be more likely to plan for agricultural professionalization than those who are dissatisfied.

Apart from economic factors, due to the social structures in which farming is embedded, farmers' planned behavior is also influenced by social relationships within and outside of the family (MEERT et al.,

2005; DRIES et al., 2012). In family farming, these social structures are characterized by a closely knit network of family, household and farm as well as by the social integration of the farmer in the community. In the Theory of Planned Behavior, the influence of these relationships is recognized by subjective norm, which is grounded on the beliefs of a subject about the likelihood that important referent individuals or groups (salient referents or "important others", AJZEN, 1991: 195) approve or disapprove of him or her performing the behavior in question. These beliefs are then weighted by his or her motivation to comply with the referent or referent group. In our study, we use social capital as a measure of subjective norm, which we justify on the following reflections: first of all, we follow COLEMAN (1990), who understood social norm, which in the Theory of Planned Behavior is measured as subjective norm, as social capital being embodied in family relations and social relations in organizations. Social capital as trust and support in the family is built up through the relations between the family members. It is not the property of a certain family member, but as trust and support it can be used by the family members to realize their interests or plans. The same is true for social capital in organizations that is a "by-product" (COLEMAN, 1990) of the social organization. It is not the property of a certain member of the organization. But seen as reciprocal obligations and expectations of the individuals it can be used as a resource for their intentions within other affairs than the organization has been founded for.

Furthermore, we argue that the level of social capital a person is disposing of through his or her social relations at the same time is an indicator for the perception of extent and direction of expectations of "important others" with respect to planning a certain behavior. We identify and include three "important others", i.e. important referents for the heads of the farms in their planning for a household strategy. These are the family as a whole, the likely successor and the fellow members of the farmers in the organizations, in which they are active parts of the community. For these three important referents we register two forms of inner familial social capital and one form of extra familial social capital as follows: (i) For the family we integrate it as trust and support also representing expectations of family members towards the farmer's behavior. (ii) For the likely successor we include it as degree of his or her involvement in farming decisions indicating his or her influence on the household strategies in the family farm. From a more

general sociological point of view, this includes the occupational socialization process of the successor into the profession of a farmer. In family farming, this process starts early, but through the planned participation of the young generation or the prospective farmer, this should be a conscious part of the farm succession process. Through his or her involvement in farming decisions, the successor can realize his or her plans regarding the strategy of the farming household already before the transfer of the property of the farm (POTTER and LOBLEY, 1996; ERRINGTON, 1998; VOGEL et al., 2004). (iii) Finally we include the community part of social capital as honorary functions of the farmer in organizations. Here we suppose that the question of being embedded in the social environment of the community is related to expectations of the community members towards the behavior of the farmer and therefore is a good representative of social norm. We regard these three independent variables from the sphere of social capital as well representing the subjective norm, in our case the influence of the social referent or referent groups on the planning processes of farmers for their household strategies, i.e. agricultural professionalization. We assume that farmers, who have a higher social capital within the family and a higher extra familial social capital – i.e. have available a broader scope of social integration – to a higher extent plan for agricultural professionalization than those, who do not have this resource available at all or only to a lesser degree.

Support for our approach with respect to social capital comes from entrepreneurial studies or family

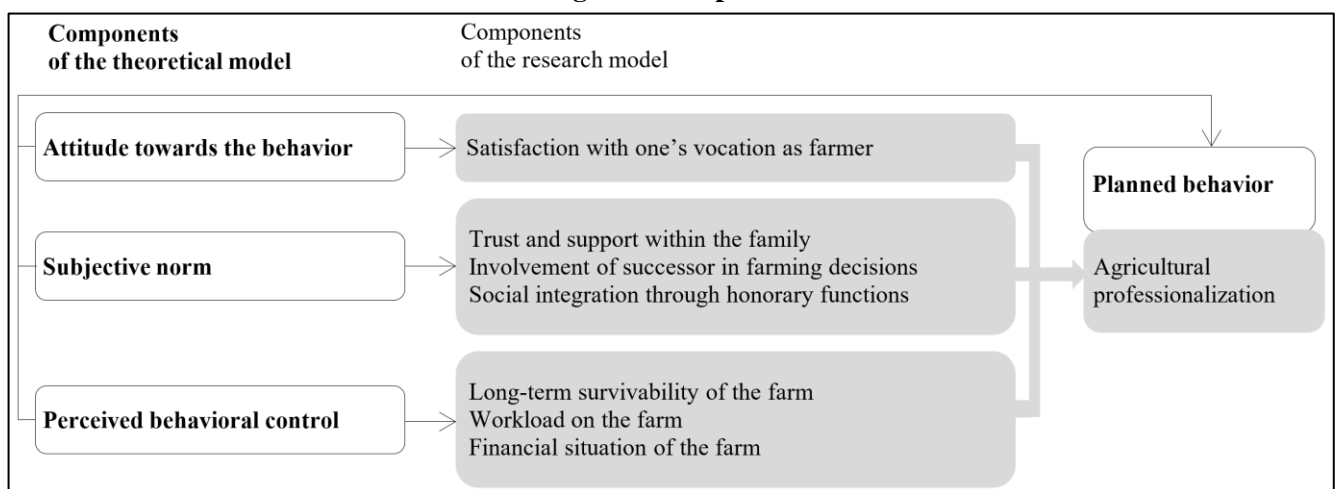
firm analyses in general, where the integration of measures of social capital into the Theory of Planned Behavior is further developed than in agricultural economics or agricultural sociology (e. g. KRUEGER et al., 2000; LIÑÁN and SANTOS, 2007; MALEBANA, 2016).

The third model component – perceived behavioral control – we register as the assessment of the financial situation of the farm, of the workload on the farm, as well as of the long-term survivability of the entire farm. We assume that farmers with a positive assessment are more likely to plan for agricultural professionalization than those with a negative view.

Hence, our research model adheres to the basic component structure of the Theory of Planned Behavior and is operationalized for the specific purpose of the investigation of farmers' intentions for agricultural professionalization. Figure 2 shows the conceived research model for our statistical analysis indicating the variables which in our study correspond to the components of the theoretical model.

In the empirical part of the article, we assess the bivariate relations between the components of our research model with agricultural professionalization in correlations and test the research model by analyzing the simultaneous influences of the statistically significant correlations in a binary logistic regression model. On basis of this analysis, we address the question to which extent Austrian farmers plan agricultural professionalization in dependency of social capital, attitudes towards farming and perceptions of restrictions in farm resources.

Figure 2. Components of the theoretical model and the research model for investigating the planned behavior of Austrian farmers for agricultural professionalization



Source: own presentation

3 Data and Methods

In this Section, we begin with presenting the survey area and our basic data. Then we shall expand upon the operationalization of the research model and the design of the questionnaire. Finally, we will explain the codification of the individual model variables, as well as the applied methods of statistical analysis.

3.1 Survey Area and Survey Data

The data acquisition was conducted during May-June 2012 in the form of a written, mainly standardized survey in the district of St. Poelten in Lower Austria (Figure 3). The survey area was selected due to its natural, agricultural and cultural diversity. In the north, it covers the Danube River Basin and the lower Traisental, where mainly agricultural cultivation, viticulture, vegetable and fruit growing are established, to the central area of St. Poelten, which is characterized by intensive agriculture and livestock farming, to the typical agricultural pastures of the Alpine foothills in the south. The district of St. Poelten comprises almost all types of settlement structures from urban settlements to historical villages built along transit roads, as well as solitary farms (ENGELHART et al., 2012).

In the study area, approximately 3,000 male and female farmers officially heading a farm operation were registered by the farmers' accident and health insurance (Sozialversicherungsanstalt der Bauern – SVB)

in April 2012. The four-pages questionnaire was sent to 1,520 of these farmers, who were at least 45 years of age. This age limit for the participation in the survey was chosen, because in the family life cycle it represents the stage, where farm succession has a relevant influence on farming plans. Out of the 1,520 addressees of the survey the return rate was 25%, which corresponds to 388 returned questionnaires.

The data set contains 42% questionnaires from women and 58% from men. The comparison to the total population of 27% female and 78% male farmers officially heading a farm operation in the study area at the time of the survey (information obtained from Bezirksbauernkammer St. Poelten in 2014) suggests that women were more interested in the survey than men. Furthermore, the percentage of full-time farmers participating in the survey was higher at 64% than those in the population at 53% (STATISTIK AUSTRIA, 2013). One reason for the unequal participation in this survey could be that the issue of the future orientation of the farm is more predominant in farming families with full-time farms, since agricultural production forms their sole source of income. In contrast, this may not be the case in part-time farms, so that a corresponding survey is of less interest to part-time farmers.

At the time of the survey, all respondents were at least 45 years of age, which is important to consider farm succession. About 48% of these farmers indicated that they already had determined a farm successor.

Figure 3. The survey area – the Austrian district of St. Poelten



Source: own presentation

Further 19% stated that the farm successor has not been determined, but that there is a prospective successor. Another 12% of the respondents also indicated that the successor has not yet been determined, but that there are several possible successors. This adds up to almost 80% of the respondents, who had the possibility to discuss their plans for agricultural professionalization with their identified or likely successors or to involve them in the decision process.

About half of the farmers engage in at least one honorary function. About two thirds (66%) of these 169 farmers, who are engaged in honorary activities are holding two or more different functions. They engage in a total of 235 honorary functions. In the survey, the farmers also indicated the type of their honorary function or functions. 72% of these functions are directly tied to the professional roles of the respondents as farmers (traditional work-related interest groups and professional bodies, functions in rural bank and loan institutes and farmers' cooperatives for buying input and selling products). Another 17% of the functions are indirectly related to the profession of the respondents, e.g. in associations for the purpose of supplying, building or maintaining infrastructures (water supply, wastewater, land consolidation, farmland routes), functions in political structures and farmers' legal representative bodies on several territorial levels, administrative functions in community and on territorial levels as well as functions in rural development. The remaining 11% of functions can be allocated to club activities (sports, music, fire service, social care, cultivation of traditions) and church related functions.

The original data set contained 388 questionnaires. Out of these, 41 respondents already have undertaken agricultural professionalization by converting to the mode of organic production (11%). Hence, as "conversion to organic farming" is one of four behaviors, that are included in our dependent variable, the organic farmers only have three open options in planned behavior as compared to conventional farmers with four options. Therefore, together with fourteen missing values in the dependent variable, they were excluded from the analysis such that the data set consists of 333 cases. With respect to their long-term intentions for the farm, 126 of these farmers (38%) plan for agricultural professionalization by purchasing or leasing new farmland, expanding agricultural production, expanding direct marketing and converting to organic production. Another 207 farmers (62%) do not plan for agricultural professionalization but for

other strategies like farm extensification or withdrawal from farming.

3.2 Operationalization of the Research Model

The research model (Figure 2) conceived for our study was operationalized as follows:

Planned behavior, as dependent variable, was constructed in the form of a binary variable based on the answers of the farmers to the item in the questionnaire: "What long-term changes are you or your successor planning for your farm?". If at least one of the reply categories "purchase or lease new farmland", "expand agricultural production", "expand direct marketing" and "convert to organic production" was indicated then it was coded as 1 = "planned behavior agricultural professionalization". The other reply categories, indicating stable reproduction or disengagement from agricultural production, were coded as 0 = "no planned behavior agricultural professionalization".

The attitude towards the behavior was determined according to the variable of "satisfaction with vocation as farmer". Regarding the statement "I am satisfied with the choice of my vocation (farmer)" in the survey, farmers were given the chance to choose their subjective assessment between the following categories from: 1 = "not at all" to 5 = "absolutely". The statistical analyses incorporated the variable with the coding from the questionnaire (1 to 5) for correlation analysis and as a dichotomized variable for regression analysis.

To operationalize the subjective norm, we relied on the concept of social capital and measured farmers' social capital within the family (inner familial social capital) and farmers' social capital stemming from their social relations in the community (extra familial social capital). The variables for the social capital within the family are: (i) trust and support within the family and (ii) the level of involvement of the successor in farming decisions. As an indicator for extra familial social capital we assess the participation of the farmers in honorary functions. Concerning trust and support within the family, this form of social capital was assessed in the questionnaire by means of a scale with a total of eight statements and five levels of evaluation from 1 = "not at all" to 5 = "absolutely", which was developed on basis of qualitative research in the same region of Austria (ENGELHART et al., 2012). The eight statements of the scale to measure trust and support within the family are the following: "social cohesion works without fail in our family"; "we have great

understanding for the issues of each individual family member”; “our family lacks a good basis for communication”; “apart from our work, we don’t have a lot in common that we can talk about in our family”; “in our family we don’t have any social cohesion”; “in our family we speak openly about our worries”; “our family lacks time for mutual conversations”; and “our family rarely adheres to what was agreed upon”. With a Cronbach’s Alpha of 0.850 the scale proves to be on a very good level of internal consistency and reliability (BÜHL, 2012). After a reversion of the negatively formulated statements, a total sum was tabulated for each farmer according to the evaluation of the eight statements. For the correlation analysis the variable obtained between the figures of 1 and 33 was considered interval-scaled. For the purpose of the binary regression, then the sample according to the sum values was split into halves and coded as follows: sample-half with relative lower level of trust and support within family = 0 and sample-half with relative higher level of trust and support within the family = 1.

To evaluate the inner familial social capital in the form of involving a likely successor in decision-making processes regarding the farm, we utilized a measurement tool developed by ERRINGTON (1998) and previously applied in Austria (GLAUBEN et al., 2004). The farmers were asked: “How do you and your likely successor make the following decisions?” regarding the four areas of entrepreneurial decision-making: “planning of daily work”; “deciding on the type and model of agricultural machinery and equipment”; “deciding on when to sell produce and livestock”; as well as “long-term decisions on production branches and method of agricultural production”. Each topic could be replied to using answer categories 1 = “I decide alone”; 2 = “my successor decides with me”; 3 = “we make a mutual decision”; 4 = “I help to make the decision” and 5 = “my successor decides alone”. With a Cronbach’s Alpha of 0.91 this scale proved to be of a high level of internal consistency and, hence, reliability (BÜHL, 2012). The answers made by each farmer resulted in an interval scale between 1 and 17 for the four decision-making areas. In those cases, where the successor had not yet been determined, or no successor had been found, the variable was coded as 0. For the binary regression model, the sample was divided into two halves: Sample-half with no or relative lower level of involvement of successor = 0 and sample-half with relative higher level of involvement of successor = 1.

The operationalization of extra familial social capital of farmers took place by recording the answers of the respondents to the question: “Do you have any honorary functions?”. The corresponding codification was: 0 = no honorary function; 1 = at least one honorary function.

The perceived behavioral control in our research approach is represented by three variables: (i) the assessment of the long-term survivability of the farm; (ii) the evaluation of the work load on the farm; and (iii) the assessment of the financial situation of the farm. In the questionnaire, these variables were determined according to the following statements: “our farm can survive on the long term”; “the workload in our farm is very high” and “our farm is in a difficult financial situation” with five levels of assessment from 1 = “not at all” to 5 = “absolutely”. These variables were applied in our statistical analyses as coded according to the questionnaire (1 to 5) and as dichotomized variables.

3.3 Methods of Statistical Analysis

First, correlations were analyzed between the independent variables in the research model and the dependent variable of planned behavior for agricultural professionalization. As already mentioned earlier, 41 organic farmers of the total 388 cases of the data set were excluded from the analyses as they already had chosen one of the professionalization strategies in the past and, hence, could not be compared to the conventional farmers in the data set. From the resulting data set with 347 responses, depending on the number of missing assigned values, the cases incorporated in the correlation analyses were between $N=320$ and $N=336$.

As testing for multicollinearity did not indicate problems in data requirements for regression analysis, all significant correlating independent variables ($p \leq 0.05$) underwent a binary logistic regression. 50 of the 347 responses contained missing answers in at least one of the variables of the research model for the binary logistic regression and therefore could not be used for this analysis. Missing data was not substituted, because no systematic pattern could be determined, so that no dependable compensatory data could be ascertained (HOHL et al., 2005) and the available data set for regression analysis comprised a total of 279 cases.

The binary logistic regression analysis was chosen for two reasons: our dependent variable is dichotomized.

tomous in such whether the farmers plan for professionalization or not. We could not establish any rank among the different subcategories of a professionalization strategy, because we are not able to calculate any degree of professionalization e.g. by having available costs and benefits of the professionalization strategies. The second reason for using binary logistic regression analysis is the good possibility to present and interpret the statistical results. By use of the logistic function, the estimated regression coefficients can be transformed to determine probabilities for the existence of a professionalization strategy. A probability for any combination of the significant determinants can be calculated resulting in the possibility of a very clear presentation of the interaction of the factors, which give rise to a professionalization strategy.

The binary logistic regression was done using the method of forward selection. Based on the so-called zero model (only includes the constants), each variable with the largest correlation to the dependent variable is added stepwise and checked to determine whether it significantly improves the model. At the same time, it is determined whether any variables need to be removed again to improve to model (test statistics: *Wald statistic*, $-2 \log$ likelihood value for the zero model, χ^2 value for model improvement). When no significant model improvement can be determined, then no further variables are added or removed (BÜHL, 2012). The binary logistic regression represents a probability relationship between the planned behavior ($y = 1$) and the independent variables (x_i), so that it is also called a linking function (LANDAU and EVERITT, 2004). As demonstrated by Formula 1, the logistic regression function imputes a non-linear relationship between the likelihood of planned behavior ($P(y = 1)$) and the aggregated degree of influence (z , also called logit) of the independent model variable x_i . A linear relationship to x_i is imputed for z (cf. Formula 2). The regression equation estimates the weights (coefficients b_i), by which the explanatory variables x_i influence the height of z and thus $P(y = 1)$ (RABE-HESKETH and EVERITT, 2006; BACKHAUS et al., 2016).

$$P(y = 1) = \frac{1}{1 + e^{-z}} \quad (1)$$

(Euler's number $e = 2.71828183$; $P \geq 0.5$ = planned behavior, $P < 0.5$ = no planned behavior)

$$z = b_1 * x_1 + b_2 * x_2 + \dots + b_n * x_n + a \quad (2)$$

(independent model variables x_i ; aggregated degree of influence of the independent model variables z ; coefficients estimating the height of influence of the model variables b_i ; constant a)

To test for multicollinearity for each independent variable x_i , a regression on the other independent variables was calculated. Resulting values of the coefficient of determination of these regression analyses (R_j^2) of 1 or near 1 or tolerance coefficients ($1 - R_j^2$) of 0.1 or lower indicate that the variable x_i can be reconstructed by a linear combination of the other independent variables and, hence is redundant. For the independent variables the tolerance value ranges from 0.67 to 0.96. However, there is no formal bottom-line of the tolerance value. Additionally, a later comparison of this coefficient of determination with the one of the regression model was applied, where multicollinearity is considered as statistically significant if $T_j < (1 - R_j^2)$ (BELSLEY et al., 1980; BACKHAUS et al., 2016). As the figures in testing multicollinearity are sufficient for all variables, all correlating variables were considered in the following binary logistic regression.

4 Results and Discussion

In this Section, the results of the correlation analyses will be presented first. Then the regression model will be illustrated and discussed, as well as the calculated relationships between the independent variables and the likelihood of planned behavior for agricultural professionalization.

4.1 Presentation of the Independent Variables and Correlations with Planned Behavior

As shown in Table 1, the dependent variable of planned behavior for agricultural professionalization correlates with all three components according to the underlying theoretical model – attitude towards the behavior, subjective norm and perceived behavioral control. There is a positive correlation with the attitude towards the behavior in terms of satisfaction with the choice of vocation. This means that farmers, who are satisfied with their vocation as farmer, are more likely to plan for agricultural professionalization than those who are not satisfied with it.

The results of the model with respect to the theoretical component subjective norm illustrate that the distribution of social capital correlates positively throughout with plans for agricultural professionalization. Thus, those farmers, who enjoy a greater degree of support and trust in their family and a social integration through honorary functions, as well as whose

likely successors participate more in decision-making on the farm, are more likely to plan for agricultural professionalization than others.

Regarding the theoretical component perceived behavioral control, it seems that the positive relationship between plans for agricultural professionalization and an optimistic assessment of the long-term survival of the farm is immediately plausible, because planned behavior and long-term perspectives support each other. One reason for the positive correlation of planned behavior with a very high workload on

the farm could be that the perceived workload leads to steps towards professionalization, which can reduce the workload (e.g. intensification of production along with increased standardization and a more rational use of farm implements and machinery). The negative correlation of planned behavior with the assessment that the farm is in a difficult financial situation is also immediately obvious, because the required financial resources for implementing an agricultural professionalization would most likely not be available.

Table 1. Research model – key figures and correlations of independent components with planned behavior

Independent research model components and related variables	Planned behavior agricultural professionalization (PB)				Correlation with PB	R _j ²	T _j
	PB = 1		PB = 0				
	Number of farmers	Mean/average score (SD)	Number of farmers	Mean/average score (SD)			
Attitude towards the behavior:							
Satisfaction with vocation as farmer 5-point scale from 1 = not at all to 5 = absolutely	126	4.29 (0.99)	203	3.50 (1.15)	0.36***	0.33	0.67
Subjective norm:							
Trust and support within the family 0 = sample-half with relative lower level of trust and support within family 1 = sample-half with relative higher level of trust and support within family	124	0.58	193	0.43	0.15**	0.12	0.88
Involvement of successor in farming decisions 0 = sample-half with no or relative lower level of involvement of successor 1 = sample-half with relative higher level of involvement of successor	126	0.64	206	0.37	0.25***	0.11	0.89
Engagement in honorary functions 0 = no honorary function 1 = at least one honorary function	124	0.64	204	0.43	0.20***	0.04	0.96
Perceived behavioral control:							
Long-term survivability of the farm our farm can survive on the long term with 5-point scale from 1 = not at all to 5 = absolutely	126	3.60 (1.15)	200	2.49 (1.32)	0.39***	0.38	0.62
Workload on the farm the workload in our farm is very high with 5-point scale from 1 = not at all to 5 = absolutely	124	3.77 (1.05)	205	3.52 (1.04)	0.14*	0.07	0.93
Financial situation of the farm our farm is in a difficult financial situation with 5-point scale from 1= not at all to 5 = absolutely	126	1.87 (1.07)	203	2.32 (1.28)	-0.18***	0.20	0.80

Notes: Correlation Analysis: N is between 320 and 336 (according to missing values in the variables).

Planned Behavior Agricultural Professionalization (PB): Mean: 0.378,

0 = no planned behavior agricultural professionalization,

1 = planned behavior agricultural professionalization: “purchase or lease new farmland” and/or “expand agricultural production” and/or “expand direct marketing” and/or “convert to organic production”.

Correlation with PB: Rank correlation (Spearman), Phi-4-correlation, Fisher’s exact test: *** $p \leq 0.001$; ** $0.01 \geq p > 0.001$; * $0.05 \geq p > 0.01$.

R_j^2 : Coefficient of determination of the regression of the independent variable x_i on the other independent variables.

T_j : Tolerance = $1 - R_j^2$.

Source: own calculations

4.2 Results of the Logistic Regression Model

Those variables from Table 1 with the correspondingly highest correlations to the dependent variable were incrementally incorporated in the binary logistic regression model. In each step, the previously incorporated variables were removed, if this led to a significant improvement of the model ($p \leq 0.05$). The resulting regression model incorporates the five independent variables x_1 = “trust and support within the family”, x_2 = “engagement in honorary functions”, x_3 = “involvement of successor in farming decisions”, x_4 = “long-term survivability of the farm” and x_5 = “satisfaction with one’s vocation as farmer” (cf. Table 2).

The test statistics found in Table 2 give evidence of the diagnostic performance of the regression model. The variance in the data explained by the regression model lies at 46%, which means the total diagnostic performance of the model is good (BACKHAUS et al., 2016). The capacity of the regression model to correctly forecast the characteristics of the dependent

variable (planned behavior agricultural professionalization) according to the characteristics of the independent variables is shown as the relative share of the median of correctly classified cases. The higher this figure lies above the maximum chance probability (maximum hit ratio when allotting all cases to the larger group), the better the adaptability of the respective model. Table 2 illustrates that the model’s average hit ratio of about 77% correctly assigned cases lies clearly above the maximum chance probability of 62%. Therefore, the model exhibits acceptable forecast accuracy.

The magnitude of influence of the independent variables on planned behavior can be quantified with help of odds ratios. They express the relative chance that planned behavior will be implemented in the event that one of the independent variables is increased by one unit. In the case of an odds ratio >1 , the relative chance increases in favor of the planned behavior agricultural professionalization; whereas at values <1 , it decreases. For example, an odds ratio of

Table 2. Results of the binary logistic regression

Variable in regression model (N=297)		Weights ^(a) b_i	Odds-ratio ^(b) e^{b_i}	Standard error sf	Test statistics ^(c)				
					Nagelkerke	Model fit	% correct classification ^(d)		
					R ²	Chi ²	1	0	Ø
X_1	Trust and support within the family 0 = sample-half with relative lower level of trust and support within family 1 = sample-half with relative higher level of trust and support within family	0.880**	2.411	0.302	0.209	49.078	59.3	80.7	72.4
X_2	Engagement in honorary functions 0 = no honorary function 1 = at least one honorary function	1.015***	2.759	0.305	0.342	36.177	58.4	83.4	73.8
X_3	Involvement of successor in farming decisions 0 = sample-half with no or relative lower level of involvement of successor 1 = sample-half with relative higher level of involvement of successor	1.191***	3.290	0.310	0.391	14.402	58.1	83.4	73.8
X_4	Long-term survivability of the farm 1 = not at all, 0 = other opinion	- 3.578***	0.028	1.040	0.434	13.661	68.1	80.1	75.5
X_5	Satisfaction with one’s vocation as farmer 1 = absolutely, 0 = other opinion	1.661***	5.265	0.315	0.461	8.622	67.3	82.3	76.5
a	Constant	- 2.405							

Notes:

^(a) evaluation of the significance of the weights (Regression coefficients b_i) via Wald statistics; *** $p \leq 0.001$; ** $0.01 \geq p > 0.001$; * $0.05 \geq p > 0.01$

^(b) e = Euler’s number

^(c) The evaluation of the model’s goodness of fit is measured via the negative double value of the likelihood function (-2LL-Wert). Based on the model, which only comprises the constants (-2LL-value = 293.543), the improvement of the model’s goodness of fit is indicated as Chi² value for each variable included in the model.

^(d) planned behavior of agricultural professionalization = 1; other household strategy = 0

Source: own calculations

2.411 for the variable x_1 means that farmers who engage in one or more honorary functions have a relative chance of around 2.4:1 planning for long-term agricultural professionalization in comparison to farmers without any honorary function.

We would like to return to the initially posed question of the degree of likelihood that farmers plan for agricultural professionalization as their long-term household strategy. In order to answer this question, the likelihood of planned agricultural professionalization was calculated for combinations of independent variables using formulas (1) and (2), as well as the results from Table 2. Table 3 displays the results for all possible combinations of independent variables.

Table 3 shows, that the highest likelihood of agricultural professionalization is found at 91% in the case of farmers in the sample-halves with higher level of trust and support in the family and higher involvement of the likely successor in farming decisions, who engage in one or more honorary function/s, who are

fully satisfied with their vocation and optimistically assess the farm's long-term survivability. Furthermore, the table clearly shows that plans for agricultural professionalization can hardly be expected, if a farmer holds a pessimistic view of the long-term survivability of the farm.

Table 3 depicts the substitution effects of the independent variables: On basis of an optimistic assessment of the long-term survivability and a full satisfaction with the vocation as farmer, likelihoods of planned behavior for agricultural professionalization over 50% can only be observed if the farmer disposes of a higher level in at least one of the three categories of social capital. If the farmer is not fully satisfied with his or her vocation, only a combination of an optimistic assessment of the survivability of the farm with higher levels in all three categories of social capital leads to a probability of more than 50% for planning for agricultural professionalization (line one, column three of Table 3).

Table 3. Predicted likelihood of planned behavior for agricultural professionalization for combinations of model components according to regression results and for corresponding absolute numbers in the data set for $P(y=1)$

Likelihood of planned behavior for agricultural professionalization $P(y=1)$				Attitude towards the behavior / Perceived behavioral control			
				fully satisfied with vocation ^(a)		not fully satisfied with vocation ^(b)	
				optimistic ^(c)	pessimistic ^(d)	optimistic ^(c)	pessimistic ^(d)
Subjective norm/Social capital	higher level of trust and support in the family ^(e)	higher successor involvement ^(g)	honorary function/s ⁽ⁱ⁾	0.91	0.23	0.66	0.05
			no honorary function ^(j)	0.79	0.10	0.42	0.02
		lower successor involvement ^(h)	honorary function/s ⁽ⁱ⁾	0.76	0.08	0.38	0.02
			no honorary function ^(j)	0.53	0.03	0.18	0.01
	lower level of trust and support in the family ^(f)	higher successor involvement ^(g)	honorary function/s ⁽ⁱ⁾	0.81	0.11	0.45	0.02
			no honorary function ^(j)	0.61	0.04	0.23	0.01
		lower successor involvement ^(h)	honorary function/s ⁽ⁱ⁾	0.57	0.04	0.20	0.01
			no honorary function ^(j)	0.32	0.01	0.08	0.00

Notes:

^(a) fully satisfied with choice of vocation as farmer = 1

^(b) fully satisfied with choice of vocation as farmer = 0

^(c) Long-time survivability of farm is not at all secured = 0

^(d) Long-time survivability of farm is not at all secured = 1

^(e) sample-half with higher trust and support in family = 1

^(f) sample-half with higher trust and support in family = 0

^(g) sample-half with higher involvement of successor in farming decisions = 1

^(h) sample-half with higher involvement of successor in farming decisions = 0

⁽ⁱ⁾ one or more honorary functions = 1

^(j) one or more honorary functions = 0

Source: own calculations

5 Conclusion

The novelty of the empirical research presented in this article is to combine specific measures of farmers' social capital with their satisfaction with the vocation as farmer and their perceptions of workload, financial situation and survivability of the farm in a theoretical research model for explaining the occurrence of planned agricultural professionalization. The research model was investigated in a binary logistic regression model using survey data from the Lower Austrian district of St. Poelten.

Employing the binary logistic regression, five independent variables were found to influence planned behavior, explaining the intentions of the farmers to a varying degree: (i) 21% trust and support within the family; (ii) 13% engagement in honorary functions; (iii) 5% involvement of successor in farming decisions; (iv) 4% long-term survivability of the farm; and (v) 3% satisfaction with one's vocation as farmer. In total, a share of around 46% of the variance of planned behavior is explained, which confirms the goodness of the model and the suitability of the theoretical modeling approach, in principle.

In previous analyses, which found evidence for cyclic activities or spiraling activities in connection with innovations in Austrian agriculture, this activity cycle was based on earlier innovations in the family farm (LARCHER, 2009; HUBER et al., 2015). The present study adds to this aspect of the discussion the fact that an activity cycle on a farm can also be motivated by the relations assumed by the farmer in the surrounding institutional milieu. The likelihood of planned agricultural professionalization is increased by a farmer's more socially active lifestyle, which is apparent when he/she holds at least one honorary function. Consequently it is to state that an active social life can be seen as an important supporting factor of plans for agricultural professionalization. This result is in line with MEERT et al. (2005) exploring that a high level of social capital, measured as membership in organizations and density of social networks promotes agricultural professionalization. It also supports the findings of DRIES et al. (2012) showing that social capital formed by extended networks involving farmers and non-farmers is influencing intentions of agricultural diversification positively.

However, in addition to these studies referring solely to networks of the farming family to people outside the family, our results demonstrate the importance of inner familial social capital: We also iden-

tified a "successor effect" that is the positive influence on planned behavior which stems from the involvement of the likely successor in farming decisions.

A positive assessment of the survivability of the farm and a positive attitude towards one's vocation as farmer in combination with a high level of inner and extra familial social capital support plans for agricultural professionalization. In this study's survey, for inner familial social capital we identified a positive influence through a higher level of trust and support in the family and a higher level of successor involvement in farming decisions. For extra familial social capital, the engagement in honorary functions was found to be important for stimulating change in agricultural strategies towards professionalization. Farmers often are aware of the fact that their engagement in the rural community may render not only information, but also mutual trust, obligations and expectations, which represent resources that can be used to realize their plans and interests.

In the family, the different beliefs of family members with respect to farm succession and farm development should be discussed early and frankly. The steps of farm succession and their timely sequence should be planned in a clear manner. To facilitate this, planning for farm succession should be understood as part of the farm development and should be taught in agricultural schools. Instead of waiting until farmers spring into action for consultancy, low threshold services of farmers' agencies or local farmers' associations (e. g. combining the presentation of issues of farm succession with other agenda in meetings) may foster early planning for succession. In farming families, parents should be aware of the fact that not only the way they integrate the prospective farm successor in farming affairs will have an important influence on the future farm development, but also their vocational attitude, which they stand for vis-à-vis the next generation.

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