EXPLORING FARMERS' WILLINGNESS TO JOIN SHORT FOOD SUPPLY CHAINS

Raluca Andreea Ion[1], Anton Theodor Dimitriu[2], Ovidia Ramona Popa[3], Alexandra Mit[4], Claudiu Tudorache[5]

Abstract

Romanian agriculture is dominated by numerous small and medium-sized producers, who barely manage to market their outputs. Scientists indicate that cooperation by forming short chains may overcome this situation, thus the paper explores the willingness of farmers to join short food supply chains, starting from the premise that most of them want to organize themselves in such networks. The objectives of the research are to identify the challenges faced by small and medium-sized farmers, and the factors that determine them to form short supply chains. To achieve this goal, a survey has been conducted to identify the correlations between farmers' willingness to join short chains and the factors that may influence this decision: producer's experience, farm size and profile, and form of organization of the farm. The main findings show that farmers' willingness to join short supply chains is influenced by the farm profile, more precisely, farmers who grow vegetables and raise animals are willing to form short chains to market their outputs. Derived results can be used in macroeconomic policy decisions, targeting these farmers in particular with incentives for the formation of short supply chains.

Key words: Food supply chains, small and medium farms, local markets, Romanian agriculture.

JEL[6]: Q13, Q18, M31

1 Raluca Andreea Ion, Ph.D., Full Professor, Bucharest University of Economic Studies, Piata Romana no. 6, Bucharest, Romania, Phone: +40 213 191 900, E-mail: raluca.ion@eam.ase.ro, ORCID: 0000-0001-7182-5809

2 Anton Theodor Domitriu, Ph.Ds, Bucharest University of Economic Studies, Piata Romana no. 6, Bucharest, Romania, Phone: +40 213 191 900, E-mail: dimitriuanton17@stud.ase.ro, ORCID: 0000-0001-8240-7696

3 Ovidia Ramona Popa, Ph.Ds, Bucharest University of Economic Studies, Piata Romana no. 6, Bucharest, Romania, Phone: +40 213 191 900, E-mail: nicapopaovidia23@stud.ase.ro, ORCID: 0009-0000-5351-7511

4 Alexandra Mit, M.A., Bucharest University of Economic Studies, Piata Romana no. 6, Bucharest, Romania, Phone: +40 213 191 900, E-mail: mitalexandra21@stud.ase.ro, ORCID: 0009-0000-4804-8183

5 Claudiu Tudorache, Ph.Ds, Bucharest University of Economic Studies, Piata Romana no. 6, Bucharest, Romania, Phone: +40 213 191 900, E-mail: tudoracheclaudiu17@stud.ase.ro, ORCID: 0009-0006-9295-6887

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Introduction

Agriculture holds a more significant position in Romania compared to other European Union (EU) member states, given that its share of GDP is double the EU average. In 2024, the share of agricultural production value in the GDP was 1.48% in the EU, while 3.28% in Romania (Eurostat, 2025). Between 2015 and 2024, the agricultural production value at basic price in Romania rose from 6,501 million EUR to 8,943 million EUR.

According to data from the latest Agricultural Census (NIS, 2020), there were 3.2 million farms in Romania, of which 92% (2.9 million) were small and medium-sized farms. The overwhelming majority of farms, 97%, fall into the category of individual agricultural holdings, while the most of them are small as they cultivate limited estates (up to 5 ha), or they rise limited number of livestock. Most of these farms are family households that mainly produce food for self-consumption, with certain surplus directed toward the market. However, marketing this production remains difficult. Therefore, adequate solutions are needed to connect farmers with the market.

Mentioned underlines the following research questions: What solutions exist for small and medium farmers to sell their production? Are farmers generally willing to participate in short supply chains and, if so, what motivates them?

The research objectives are to identify the challenges faced by small and medium-sized farmers, and their willingness to form short supply chains, based on assumption that this could be suitable method for marketing the products from small farms (Milosevic et al., 2021; Chiaverina et al., 2023; Panciszko Szweda, 2025). To achieve these objectives, a questionnaire-based survey has been conducted and the results are hereby presented.

Short supply chains are a topic of great interest in the current context of Romanian agriculture. The National Strategic Plan for 2023-2027 encourages the creation of short food chains, arguing that they are necessary, as they provide opportunities for small and medium-sized farmers by promoting and selling products close to the production capacities and source, thereby fulfilling the objectives of the EU's "Farm to Fork" strategy (Arabska, 2021; Dinu et al., 2025). This strategy is part of the European Green Deal, which aims to ensure fair, healthy, and environmentally friendly food systems.

The study is organized into several distinct sections. Firstly, it defines, along with a literature review, short supply chains. Next, it outlines the research objectives and hypotheses, followed by an explanation of the used methodology. Finally, it presents and discusses derived research results, while draws proper conclusions. The final goal of the study is in identifying the farmers challenges in selling the output and producers' willingness to form short chains, as a adequate solution to market their products.

Literature Review

From a historical perspective, the concept of the supply chain appeared for the first time in the British press. Keith Oliver was one of the earliest authors who discusses this topic in 1984, using the term „supply chain" in interview. Term refers to integrated system through which goods are transferred from one to another economic agent, until they reach the final consumer (Sherer, 2005; Chopra et al., 2019).

Chen and Paulraj (2004) describe the supply chain as a network of processing materials, information, and services related to demand. Mentzer et al. (2001) describe the logistics chain as consisting of three or more entities, organizations, or individuals directly involved in the upstream and downstream flows of products, services, finances, and information.

Some authors, as Shukla et al., 2011 and Christopher, 2022, approach the term supply chain management as the network of facilities used for obtaining and processing raw materials into intermediate goods or final products, that are further distributed to final consumers. The adoption of supply chain management practices has lately recorded significant increases because the distribution system is a key process in product marketing (Shukla et al., 2011; Janvier James, 2012).

The short supply chain generally represents the connection of consumers directly with producers (Canfora, 2016; Lavelli, 2021). The short supply chain has several purposes. One of them is being the sale of products directly by farmers in local markets, near the farms, avoiding the high costs of products distribution (the distance between the farm and the market is usually small). At the same time, the short chain also contributes to reducing pollution, because the distribution route is a short one (Benedek et al., 2018; Rucabado Palomar, Cuéllar Padilla, 2020).

The short chain is also defined in European legislation by Regulation (EU) 1305/2013 (EU, 2013), at Art. 1, Align. 2, Lit. m, as being „a supply chain involving a limited number of economic operators engaged in cooperation and local economic development activities, as well as close geographical and social relations between producers, processors and consumers".

In national legislation (Romania), the short chain is defined in Ministry of Agriculture documents (Applicant's Guide: Sub-measure 16.4 and Sub-measure

16.4a) as being that configuration of the food chain that does not involve more than one intermediary between the producer and consumer (AFIR, 2021).

Although there are previous researches that have studied the willingness of Romanian farmers to form short supply chains (Andrei et al., 2019; Popa, 2023), necessity of this study is found in changed economic reality, while current market trends indicate a clear preference of consumers for local products (Feldmann, Hamm, 2015; Zhang et al., 2022; Csordas et al., 2022) and a development of short chains (Kallas et al., 2021; Ladaru et al., 2023).

Research Objectives and Hypotheses

The research on farmers' perceptions regarding the functionality of supply chains started from the necessity to know the producers' willingness to form short chains. To fulfill this purpose, a marketing research was conducted. Its objectives and hypotheses are presented in the following.

O1: *Identifying the extent to which the farmers' activity is connected to the market.* The hypothesis linked to this objective is that a small part of the farms' production is sold on the market, as was determined in previous research: Eurostat data show that over 80% of farms in Romania produce mainly for self-consumption (EC, 2013). Similarly, Farm Structure Survey (NIS, 2020) shows that only 16.5% of farms produce mainly for the direct sales. In another research, Alexandri et al. (2015) observed that over 90% of small and medium farmers declared that more than 50% of the obtained production is used in self-consumption, which could be interpreted that the remaining 50% of the production is sold to third parties. According to that statements, the hypothesis linked to the first objective is H1: *Farmers sell under 50% of the obtained production.*

O2: *Determining the main production sales channels*. The hypothesis linked to this objective is H2: *The most part of the production is capitalized on the local market, directly to the consumer, in the case of small-sized farms*. The premise is based on the results of the survey reported by Ministry of Agriculture (MADR, 2020), which states that small-sized farmers have increased sales through all main types of distribution channels, mainly direct sales within the farm, reducing at the same time, the marketing activities carried out with wholesale intermediaries (wholesalers). In other studies (Alexandri et al., 2015), it is shown that direct sale in markets, at the farm gate or at fairs, is the main way of selling the production by small-sized farmers. In addition, a trend of consumers' preferences towards local foods has been identified (Zhang et al., 2022), which justifies the farmers' choice of selling their products on local markets.

O3: *Determining the degree of integration of farmers' activity in short chains*. Since a small number of farmers belong to short chains, the hypothesis linked to this objective could be H3: *Under 50% of farmers are part of a short supply chain.*

O4: *Identifying the farmers' willingness to integrate their activities into short chains.* If the results of previous surveys are considered (Andrei et al., 2019), which show that 82.1% of farmers want to join certain associative form of organization, and 67.1% to integrate their activity in a short supply chain, the hypothesis linked to mentioned objective is H4: *Over 50% of farmers want to join short supply chains.*

O5: *Determining farmers' perceptions regarding the functionality of the short chain for selling agricultural products*. The initial premise exposes the hypothesis H5: *The short chain for selling the agricultural products has high functionality.* Hypothesis is based on the results of previous research (Popa, 2023), showing that over half of respondents consider the short chain functional.

O6: *Determining farmers' perceptions regarding the obstacles that influence the formation of short chains*. In this objective, the hypothesis is H6: *Bureaucracy is the main challenge in short chains formation*, starting from previous research (Popa, 2023).

O7: *Determining the factors that influence the farmers' willingness to form short chains*. For this objective, it is assumed following hypothesis H7: *The willingness of farmers to form short chains is influenced by the farmer's experience, the form of farms' organization and its profile, as well as the size of farm area.*

O8: *Determining the factors that affect the extent to which farmers manage to sell their output on the market*. This objective starts from the premise H8: *The extent to which farmers' output is sold on the market is affected by the farmer's experience, the farms' form of organization and its profile, as well as the size of the farm area.*

Research Methodology

The researched problem is underlined, as there are number of small and medium farmers in Romanian agriculture, whose activity is not connected to the market. Possible solution for farmers to sell their products would be to integrate their activities into the short supply chains.

In this research, the data has been collected using the survey method. Investigation technique uses structured questionnaire. The formed sample involves 105 farmers, while their characteristics are being presented hereafter. The total population, at national level, is around 3 million farmers. Therefore, the used sample is not significant or representative for the entire population of agricultural producers in Romania, neither in number nor in characteristics, what could be considered as research limitation. The sampling method was based on the availability of farmers to respond to the questionnaire, which was distributed online through the Romanian Farmers Club, a non-profit and non-governmental association of farmers in Romania. The survey was conducted in December 2025. The questionnaire comprised 16 questions. The most of them with response options or scale type, while the last 3 are being open questions.

The dependent research variables are: production sold, destination of sold production, distribution channels, membership in a short supply chain, farmers' willingness to join short supply chains, functionality of short supply chains, obstacles in forming short chains, legislative proposals, and shortcomings. The independent variables are: farmer's experience, form of farm organization, farm size, and farm profile.

Experience of the farmers: 31.4% of the farmers have been active in agriculture for over 20 years, 29.5% of them for 10-20 years, while 27.6% for 5-10 years, and 11.5% have been active in agriculture for less than 5 years.

The form of farm organization: 25.7% of the farms operate as unauthorized physical person, 14.3% as authorized physical person, while 14.3% are family enterprises, or 17.1% are individual enterprises, and 16.2% are limited liability companies. Other forms represent 12.4%.

The size and profile of the farm: 26.9% of the farms have estate between 1-5 ha. In this segment are found the small-sized farms. Same value has the farms that have size of over 20 ha (26.9%). Next are the farms with size between 5-10 hectares (19.2%), followed by the farms with the area smaller than 1 ha (14.4%), or farms with area between 10-20 ha (12.6%).

The structure of grown crops is diversified. Some farms are growing several crops, while the most of them have been focused just to cereal sector (wheat and corn). Many farms choose to grow simultaneously vegetables and fruits.

As regards to data processing methodology, the collected data are processed using the SPSS program, the Analyze option, Descriptive Statistics, and CrossTabs. It is first checked if there are connections between dependent and independent variables, calculating the Pearson Chi-Square coefficient, which tests the association between variables. If the value of the Pearson Chi-Square coefficient significance is smaller than 0.05, it means that between the studied variables there are correlations, the error being very small.

In cases where the significance values of the Pearson Chi-Square coefficient are less than 0.05, the analysis is continued by measuring the connections between the variables, using the contingency coefficient or the Phi or Cramer V coefficient. The interpretation of the values of these coefficients is as follows: if the contingency coefficient recorded values below 0.3, it means that there is a low intensity connection between the variables, if the value is between 0.3 and 0.6, the connection is with medium intensity, while if the coefficient value is above 0.6, the connection is very strong.

Results with Discussions

The derived results of the survey are presented below.

The answers to the question "Estimate, what percentage of production do you manage to capitalize?" show that most farmers (32.4%) sell at maximum 25% of the production they obtain, 27.5% declared that they market over 75% of the production obtained, while 25.5% of farmers sell their agricultural products in a proportion of 25-50%, and 14.7% responded that they manage to sell between 50-75% of the production obtained.

The answers to the question "Where do you manage to sell the production obtained?" show that the most of farmers capitalize their production at the farm gate, in local markets, or at fairs. Farmers use several distribution channels. Most of them (77%) sell their products directly to consumers, in local markets or at weekly fairs. Another method is selling through intermediaries (44%), this process takes place directly at the farm gate. 19.2% of farmers sell their production to processors, 10.6% distribute their products to small commercial units, and 2.9% to supermarkets or hypermarkets.

The answers to the question "Are you part of a short chain?" show that 65.7% of farmers do not belong to a short chain, but most farmers are willing to be part of a short chain, because 83% answered affirmatively to the question "If you are not part, do you intend to integrate your farm's activity into a short chain?" The answers to the question "To what extent do you consider the short chain functional?" show that 55% of farmers considered that short chains have a very high, 26% high, and 16% low functionality.

Processing the answers to the question "What do you consider to be the main obstacles influencing the formation of short chains?" leads to the following hierarchy: bureaucracy, with an average score of 2.65, lack of investment or co-financing, with an average score of 2.51, poor information, with an average score of 2.48, and others, with an average score of 2.08 (on a scale from 1 (low) to 3 (high)).

The results are then analyzed for identifying the correlations between variables. The significance values of the Pearson Chi-Square coefficients and the contingency coefficients are presented in Table 1., showing the correlations between variables. If the significance values of the Pearson coefficients are less than 0.05, they are marked in bold and considered for further analysis, as they indicate significant correlations between variables. If the significance values of the Pearson coefficients are greater than 0.05, they are not marked in bold and are not considered for further analysis, as they indicate insignificant correlations between variables.

In cases of correlation between variables (if the significance values of the Pearson coefficients are less than 0.05), the contingency coefficient was calculated. The values of the contingency coefficients are placed in the Table 1. below the significance value of the Pearson coefficient. They are marked in bold if the contingency coefficient value is greater than 0.3, as it indicates a medium connection. If the contingency coefficient values are less than 0.3, they are not marked in bold, as this indicates a weak connection between the variables.

Observing the results in Table 1., the following statements could be made: production sold (Q7) is affected to a medium extent by the farm's form of organization (Q2), its size (Q3), and its profile. Correlation is being significant only for farms that grow vegetables (Q4.1) and oilseeds (Q4.3).

The market where the products are sold (Q8) is affected by the farm's form of organization (Q2), its size (Q3), and its profile (Q4), while the correlations are being significant only for farms that grows vegetables (Q4.1) and oilseeds (Q4.3).

The direct distribution of agricultural products (Q9.1) correlates with the farm's form of organization (Q2), its size (Q3), and its profile, while the correlation is being significant only for farms that grow vegetables (Q4.1) and fruits (Q4.5). Vegetable and fruit producers use direct distribution to sell their output.

Distribution to intermediaries (Q9.2) correlates with the farm's form of organization (Q2), its size (Q3), and its profile. Correlations are being significant only for farms that cultivate cereals (Q4.2) and oilseeds (Q4.3).

Distribution through processors (Q9.3) correlates with the farm's form of organization (Q2), its size (Q3), and its profile. Correlations are being significant only for farms that cultivate cereals (Q4.2), oilseeds (Q4.3), and other crops besides vegetables, potatoes, and fruits (Q4.6).

Distribution to supermarkets and hypermarkets (Q9.4) correlates only with the profile, while correlations are being significant for the farms that grow cereals (Q4.2), who definitely do not sell their production to supermarkets and hypermarkets. Distribution to small shops (Q9.5) correlates only with the profile, while correlation is being significant for farms that grow oilseeds (Q4.3). It can be observed that farmers who cultivate oilseeds do not sell their production to small shops.

The membership of farmers in short supply chain (Q10) correlates with the farm profile, while correlation is being significant only for farms that grow vegetables

(Q4.1), cereals (Q4.2), and other crops, but not oilseeds, potatoes, and fruits (Q4.6), (Figure 1.). Vegetables and cereal producers are not the part of short supply chains. Farmers that obtain other products rather belong to a short chain.

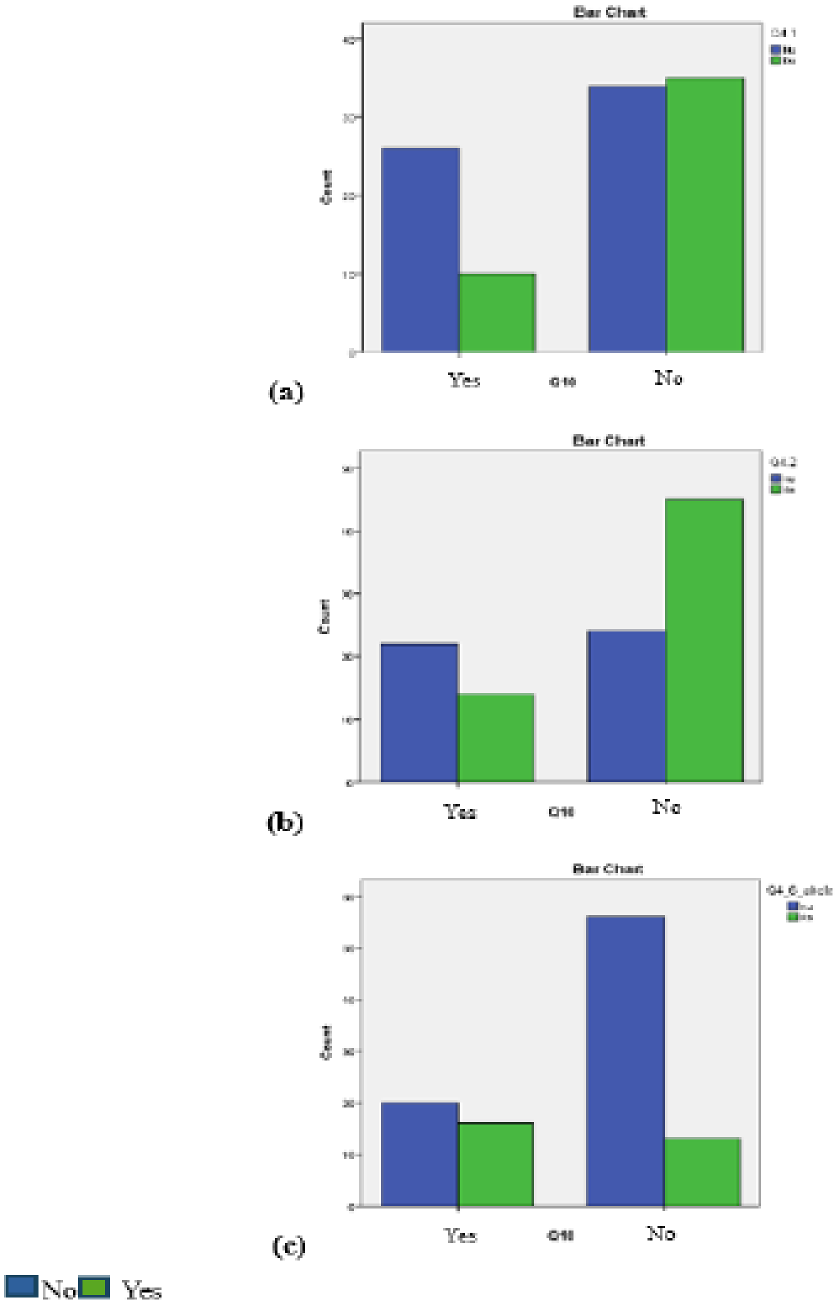
Table 1. Significance values of Pearson Chi-Square coefficients and Contingency coefficient values

Element	Farmer's experience **Q1**	Farm organization form **Q2**	Size **Q3**	Crops farms' profile **Q4**						Livestock profile **Q5**
				Vegetables **Q4.1**	Cereals **Q4.2**	Oilseeds **Q4.3**	Potatoes **Q4.4**	Fruits **Q4.5**	Others **Q4.6**	
Sold output **Q7**	0.252	**0.02* 0.502**	**0.00*** 0.538**	**0.01** 0.312**	0.327	**0.015* 0.302**	0.194	0.058	0.932	0.249
Destination of sold output (market) **Q8**	0.228	**0.000*** 0.532**	**0.003** 0.474**	**0.005** 0.333**	0.256	**0.001*** 0.361**	0.488	0.323	0.719	0.634
Distribution channels **Q9**										
- direct **Q9.1**	0.864	**0.040** 0.316**	**0.001*** 0.389**	**0.001*** 0.317**	0.478	0.172	0.418	**0.000*** 0.392**	0.569	0.231
- intermediary **Q9.2**	0.580	**0.037* 0.319**	**0.001*** 0.392**	0.954	**0.001*** 0.306**	**0.000*** 0.339**	0.594	0.253	0.682	0.985
- processor **Q9.3**	0.085	**0.023* 0.333**	**0.003** 0.364**	0.830	**0.000*** 0.355**	**0000*** 0.468**	0.373	0.430	**0.023*** 0.217	0.448
- supermarket/ hypermarket **Q9.4**	0.939	0.242	0.672	0.128	**0.047*** 0.191	0.791	0.409	0.398	0.727	0.503
- small shops **Q9.5**	0.863	0.335	0.586	0.646	0.907	**0.030*** 0.275	0.096	0.408	0.838	0.879
Membership in a short supply chain **Q10**	0.134	0.193	0.076	**0.024*** 0.215	**0.010**** 0.244	0.094	0.419	0.154	**0.004**** 0.272	0.638
Farmers' willingness to integrate their activity into short supply chains **Q11**	0.504	0.488	0.268	**0.005**** 0.266	0.407	0.749	0.459	0.221	0.458	**0.002** 0.292**
Functionality of short supply chains **Q12**	0.278	0.410	0.656	**0.028*** 0.282	0.323	0.189	0.533	0.303	0.588	0.131

*p<0.05, **p<0.01 and ***p<0.001

Source: Own processing of survey data, using the SPSS program.

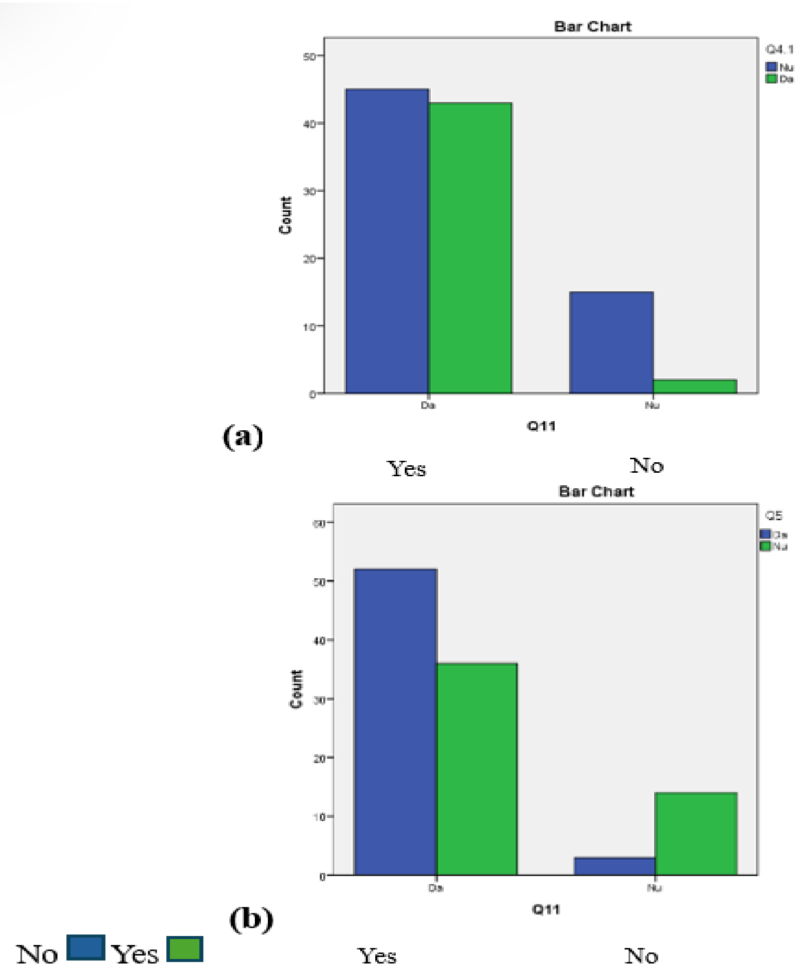
Figure 1. Significant correlations between farmers' membership in a short supply chain (Q10) and farm profile - vegetables (Q4.1 - a), cereals (Q4.2 - b), and other crops (Q 4.6 - c)



Source: Data processed in SPSS.

The farmers' willingness to join short supply chains (Q11) is affected by the farm profile, while it is being significant for vegetable producers (Q4.1), and farmers who have cattle (Q5), (Figure 2.). It is shown that vegetables producers are highly willing to be a part of short chain.

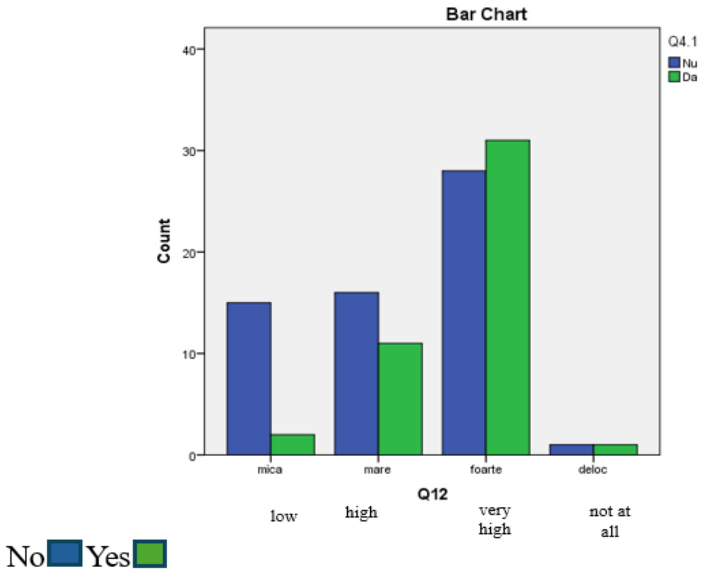
Figure 2. Significant correlations between the farmers' willingness to join short supply chains (Q11) and farm profile – vegetables (Q4.1 - a) and livestock (Q5 - b)



Source: Data processed in SPSS.

The functionality of short chains (Q12) correlates with the farm profile, while it is significant for vegetables producers (Q4.1), (Figure 3.). Very high values for the functionality of short supply chains are indicated by vegetables growers.

Figure 3. Significant correlations between short chains' functionality (Q12) and farm profile - vegetables (Q4.1)



Source: Data processed in SPSS.

Testing the research hypotheses

Previously defined research hypotheses are verified based on survey results and values of coefficients of correlations.

H1: Farmers are marketing less than 50% of produced output. The predefined hypothesis is verified, as 32.4% of the respondents sell less than 25% of their production, while 25.5% of them sell between 25% and 50% of gained output. In total, more than half of surveyed farmers (58%) manage to sell less than half of their production. These results are in line with Alexandri et al. (2015), reporting that 50% of the production obtained by small farmers is sold to third parties.

H2: Focusing to small-sized farms, the most of produced agricultural products is sold on the local market, directly to final consumers. The hypothesis is verified, as 80% of the respondents chose local markets as selling destination, no matter to the form of organization, farm profile and experience, or farm size. It is shown that small farmers sell their outputs predominantly on the local market, and this result is sustained by previous studies (MADR, 2020), showing that small farmers increased sales through all main types of distribution channels, mainly direct sales.

H3: Less than 50% of farmers are part of short supply chain. The hypothesis is confirmed, as 34% of them declare that they belong to certain short supply chain.

H4: Over 50% of farmers are willing to be a part of short supply chain. Mentioned hypothesis is validated, as 83% of the respondents have been declared that they are willing to be a part of some short supply chain. The results are consistent to those find by Andrei et al. (2019), reporting the 67.1% of them willing to integrate their activity in a short supply chain.

H5: The short chain for marketing agricultural products has high functionality. The hypothesis could be considered verified, as 55.8% of respondents find the short supply chain with very high functionality, while 26% of them consider that the functionality is high. These results are in line with other research (Popa, 2023), showing that over half of farmers consider the short chain functional.

H6: The main obstacle in formation of the short chains is bureaucracy. Hypothesis is verified in line to previously ranked main obstacles by farmers, i.e. bureaucracy, lack of investment and co-financing, poor information, etc., and also proved in some previous research (Popa, 2023).

H7: Farmers' willingness to form the short chain is influenced by the farmer's experience, farm's form of organization and its profile, or the size of farm estate. Verification of mentioned hypothesis stays upon the significant values for the Pearson coefficient in Table 1. It is underlined that farmers' willingness to join short chain depends only on the farm profile, meaning that the starting hypothesis is not true. The results are supported by other researchers (Andrei et al., 2019), who have reported that farmers' willingness to adhere to short supply chain is determined by numerous factors, including the type of farm activity.

H8: The extent to which the outputs are sold on the market is affected by the farmer's experience, farm's form of organization and its profile, as well as the size of farm estate. In this case hypothesis verification was also based according to the significance of Pearson coefficient values (Table 1.). Hypothesis is partially verified, as the values of Pearson coefficient are significant only in case of linking the total output sold at market and farms' form of organization, farm size, and profile. Hypothesis verification has failed in case of farmer's experience.

Conclusions

The paper has been explored the farmers' perceptions of short supply chains and their willingness to join them. Summarizing the research results, the following statements can be made regarding agricultural producers' perceptions of short supply chains. Farmers in Romania continue to face difficulties in marketing agricultural products, as 32.4% of them reported that they sell less than 25% of their output, while 25.5% sell 25-50% of their production. Farmers largely use local markets, and agricultural fairs, as usual destination chosen for agricultural products selling.

One alternative in overcoming farmers' problems in marketing of outputs could be further development of local markets. In addition, they call for deeper access of small farmers to current agro-food markets by establishing specially arranged spaces for producers. These spaces should be signposted, so that consumers know that the sellers are small and medium-sized agricultural producers, differentiating them from other sellers in the markets.

The development of short supply chains for agricultural products in Romania could be considered as early stage, since 65.7% of farmers are not the part of them. However, the majority of farmers (83%) want to join certain short supply chain, demonstrating their potential for development.

The main obstacles for forming short food supply chains are bureaucracy, lack of co-financing and insufficient information. Farmers argued that the bureaucracy is too complex, especially considering that the part of farmers does not have higher education required for understanding the formal parts of policy, and administrative documents and procedures.

Small farmers have to be continuously supported through agricultural policy. Required state support refers to agro-food products marketing, and implies both financial support for farms and support for establishment of processing centers and slaughterhouses at local level. Farmers underline that forming agricultural cooperatives could really facilitate their access to local market, while to reduce risks, and increase their incomes.

The main research limitation could be weak representativeness of the sample related to entire Romania (overall farming population). However, performed research based on correlations has found several factors that determine farmers' willingness to join the short supply chains. Future research steps could upgrade derived research results to underpin the decisions on agricultural policy measures aimed for supporting the formation of short supply chains at national level.

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