

COOPERATION BETWEEN AGRICULTURAL EXTENSION SERVICES AND COOPERATIVES – THE STATE AND POSSIBILITIES

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Abstract: One of the key links in the system of knowledge and information transfer in Serbian agriculture is the extension service, which acts as a mediator between scientific institutions and different user groups. Extension officers prefer to cooperate with already formed user groups, such as agricultural cooperatives, because they unite farmers with similar production and are convenient for group methods of extension work. This paper aims to examine the quality of cooperation between agricultural extension services and agricultural cooperatives in Serbia and to evaluate the views of farmers (cooperative members) on the success of this cooperation. For this research, a survey was conducted with 220 respondents, members of agricultural cooperatives. The analysis showed that over 80% of cooperative members cooperated with extension service, and that they were more satisfied with the quantity of extension services than with the quality. More than half of the respondents believe that extension services need to be adapted to the needs of cooperatives, and that the cooperatives should be given more attention in the media appearances of extension officers. This research provides an important insight into the form and specifics of cooperation between agricultural extension services and agricultural cooperatives, on the basis of which measures for their continuous improvement can be proposed.

Key words: agricultural extension service, agricultural cooperatives, attitudes of farmers, cooperation.

Introduction

Modern society is characterized by continuous development and innovation in all spheres of production and everyday life, including agriculture. The modern business is conditioned by the application of scientific and technological innovations, information and communication technologies, but also by the application of innovative business solutions, especially when connecting with external partners in the production chain (Milojević et al., 2015). Agricultural

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production implies a practice based on the use of technology and the implementation and adaptation of new knowledge.

The adoption of new technologies and innovations is a prerequisite for the successful production and survival of farmers in the market (Oreszczyn et al., 2010). Innovation can be defined as the implementation of a new or significantly improved product or process, a new market method, or a new organizational method in business practice and production organization. The macroeconomic view sees innovation as a linear process from basic research to its commercial application (EU SCAR, 2015). One of the key challenges facing modern agriculture is the timely application of existing innovations in the production process, which is one of the tasks of AKIS (Agricultural Knowledge and Information System).

AKIS can be defined as a set of people, networks, and organizations, as well as connections and interactions between them, aimed at creating, transforming, transferring, storing, and applying knowledge and information, with the purpose to support decision making, problem solving, and innovation in agriculture (Röling and Engel, 1991). In the last decade, AKIS has also included support for the application of innovations that contribute to the improvement of agricultural production (EU SCAR, 2015).

One of the key elements of AKIS in most economies, including Serbia, is agricultural extension services (AESs), which have the task of educating farmers, providing them with new information and knowledge, and helping them develop new skills. AESs transfer knowledge, information, and technology from research institutions and organizations to agricultural producers. In performing these activities, AESs implement several methods, which can be divided into individual, group, and mass media methods of extension.

The group approach in extension involves working with groups of farmers. This method is desirable not only because of the greater coverage of the target group, but also because it allows an exchange of information between extension officers and farmers, as well as among the farmers themselves. The group approach makes an important contribution to changing farmers' behavior and influences the strengthening of farmers' awareness of the importance of AES existence and activities (Čikić et al., 2009). The group approach in extension work can be carried out with existing, already organized groups of agricultural producers, such as cooperatives.

Cooperatives are a specific form of members' organization found in almost all countries of the world in all sectors of the economy. They have a long tradition that began in the second half of the XIX century, when cooperatives emerged as a response of a socially neglected part of the population to difficult living conditions. Rooted in Western Europe, cooperatives quickly spread to other parts of the continent and the world. Today, there are more than 2.5 million cooperatives

globally with over one billion members and clients. Almost half of them (48.7%) are agricultural cooperatives, making them the most important ones (UN, 2014).

Cooperatives in Serbia have had a long and turbulent history, but at each phase of their development they played a more or less important role in agriculture and rural areas. In the light of this paper, cooperatives are important in agriculture not only because they empower farmers when entering the market, but also because cooperatives are by definition an organization of farmers with similar productions and similar problems. This implies that it is more effective for extension officers to approach a cooperative than a number of individual farmers.

The aim of this paper is to examine models of cooperation between Serbian AES and agricultural cooperatives, the quality of this cooperation, and the way cooperative members perceive the contribution of extension services to the improvement of production on their farms. The main hypothesis of this paper is that AES and agricultural cooperatives collaborate, and that cooperative members perceive this as useful for the improvement of agricultural production. Based on the conducted research, the segments where this cooperation was successful, the shortcomings and the proposed ways of improving the quality of AES work with agricultural cooperatives (ACs) in Serbia were studied.

The cooperation of AES and agricultural cooperatives through the prism of legal regulations

The importance of performing extension work is recognized in relevant strategic and legal documents. The Strategy of Agriculture and Rural Development of the Republic of Serbia for the period 2014–2024 (Official Gazette of the Republic of Serbia, No. 85/14) classifies the improvement of the system of knowledge transfer and the development of human resources in agriculture as one of the 14 priority areas of agricultural policy. The transfer of knowledge in the field of agriculture includes the system of formal education at all levels and various types of training organized by educational and research institutions, AES of Serbia, private companies, media, and other organizations. In evaluating the contribution of AES to this process, it is stated that “*the organized transfer of knowledge through AES reaches a relatively small number of users*”, and that “*the existing structure and system of knowledge transfer are not efficient enough*”. It is necessary to improve the entire system of knowledge and information transfer, especially the work of AES, and to achieve greater coverage of users with its services. This can be accomplished by applying the group approaches in extension work, particularly with existing organizations of farmers, such as agricultural cooperatives.

The basic legal document that regulates the work of agricultural extension services in the Republic of Serbia is the Law on Providing Extension Service in

Agriculture (Official Gazette of RS, No. 30 of May 7, 2010), which provides general guidelines and sets rules for the work of these services. The more detailed regulation of AES work is given in secondary legal documents, primarily regulations on the medium-term development program, which are adopted for a period of five years, and in the annual regulation on establishing the development program of extension work in agriculture.

Table 1. The presence of cooperatives and associations in the work of AES.

		2017	2018	2019
The share of extension officers' working time devoted to the performance of the following advisory activities (%)				
Group methods		24.43	22.72	21.61
Work with cooperatives, groups, and associations		1.20	1.13	1.16
Number of users				
Work with cooperatives and associations	Number	2,712	2,733	2,766
Participation in the number of users covered by group methods	%	6.45	6.97	7.79
Share in the total number of users	%	3.27	3.10	3.44

Source: Authors' calculation based on data from the Regulation on the medium-term program for the development of extension services in agriculture for 2021 to 2025

The regulation on the medium-term program for the development of agricultural extension services for 2021 to 2025 states that the priority of agricultural extension work is to assist and help users, including cooperatives, associations and producer organizations. Cooperation with these types of users is achieved through group extension methods. In 2017–2019, extension officers spent an average of 1.16% of their working time providing services to this category of users. At the same time, the share of working time spent on group extension methods decreased from 24.43% to 20.63%. The number of cooperatives and farmers' associations covered by extension services in the same period increased to a maximum of 2,766 in 2019.

A more detailed overview of extension work with cooperatives is provided in the Regulation on Annual Program for the Development of Extension Services in Agriculture for 2022 (Official Gazette of the RS, No. 18 of February 11, 2022). Each extension service monitors at least one cooperative that operates in the area where the service provides extension work. The number of cooperatives with which an individual extension officer works can range from one to 12, and he or she is required to visit each of the selected agricultural cooperatives four times per year. In addition, extension officers are obliged to give at least one lecture, attend lectures of one winter school, and make one television appearance annually in the area of supporting the creation, development and revitalization of agricultural

cooperatives. The selection of cooperatives to be included in the extension work is made on the basis of a written proposal from the Cooperative Union of Serbia, which indicates that a certain form of cooperation already exists between the institutions in the agricultural sector.

Material and Methods

The results of the research conducted in December 2020 by the Cooperative Union of Serbia on a sample of 220 agricultural cooperatives from all over the country are presented in this paper. The first criteria were that the cooperative was involved in agriculture, that it was situated in rural areas, that it was a member of the Cooperative Union of Serbia and that it had an e-mail address in the database. A questionnaire was sent by e-mail to all cooperatives that met these criteria. After a week, the cooperatives that had not responded were contacted by phone, and kindly reminded to participate in the study. There were 220 responses, and all were valid, so they were included in the sample.

The opinions of farmers and members of agricultural cooperatives on the use of agricultural extension services were collected using a questionnaire distributed in direct contact with representatives of cooperatives and their members.

The collected data were analyzed in Excel using descriptive statistics, and the Pearson's linear correlation coefficient to determine the relationship between two observed variables. The comparative method was also used to compare the obtained results with other similar studies. In addition to the primary data collected in the described research, legal documents that regulate the work of agricultural extension services in the Republic of Serbia and available relevant literature were also used.

Results and Discussion

The survey included 220 respondents, of whom the majority (140 or 63.6%) were men. The average age of the respondents was 46 years, and the two extreme interval groups (younger than 30 and older than 60) were represented by only about 10% (Table 2).

Most of the respondents (almost half) had a secondary school degree, while 37.3% had a college education, and 14.1% had the highest educational qualification. This educational structure differs significantly compared to the total population in rural areas (the so-called other settlements), where, according to the results of The Census of Population, Households and Dwellings in the Republic of Serbia (2011), 42.4% of the population had secondary education, and only 6.1% higher education. The majority of respondents (78.2%) indicated a village as their place of residence, while about one-fifth of them lived in urban and suburban settlements (Table 2).

Table 2. The socio-demographic characteristics of the respondents.

Variable	Frequency	%
Gender		
<i>Male</i>	140	63.6
<i>Female</i>	80	36.4
Age		
<i>Up to 30</i>	20	9.1
<i>31 to 40</i>	48	21.8
<i>41 to 50</i>	88	40.0
<i>51 to 60</i>	40	18.2
<i>Over 60</i>	24	10.9
Degree of education		
<i>Primary</i>	7	3.2
<i>Secondary</i>	100	45.5
<i>Tertiary</i>	82	37.3
<i>Master's degree and Ph.D degree</i>	31	14.1
Place of residence		
<i>Rural area</i>	172	78.2
<i>Urban area</i>	48	21.8
Total respondents	220	100.0

Source: Authors' calculation.

Of the total number of respondents, 202 or 91.8% stated that they were employed, of whom 50.5% worked in a cooperative, about one-third (31.3%) were employed on their own farms, and 37 (18.3%) were employed in another company. Respondents who stated that they were not employed were mostly retired elderly people.

Of 220 respondents, 26 of them (11.8%) did not use agricultural extension services. Among them, there were slightly more women (42.3%, compared to 36.4% in the entire sample), and most of them had a higher level of education, i.e., there were no persons with only primary education in this group. This can be explained by the fact that these respondents have a certain level of knowledge or skills and abilities to collect the information they need, and therefore consider that they do not need AES. They are more likely to face the challenges on their own, without the support of AES. As most extension services face an insufficient number of extension officers and the increasing need to provide services to marginalized social groups in the rural population, one should not insist on the full coverage of farmers by extension services.

Contrary to this group of respondents, 194 (88.2%) stated that they cooperated with AES. This is significantly higher than in other similar studies, which have found that only 30% of farmers have contact with extension services, and that only when extension officers come to their farm (Dimitrijević and Stojić, 2019).

Although this could be interpreted as a weak effect of extension work, at the same time it indicates the rigidity of farmers and their unwillingness to proactively participate in increasing their knowledge.

It is interesting to note that 41.8% of the respondents stated that they had contact with AES for more than two years, while 36.6% of them cooperated with them for less than one year. According to the legal framework, an extension officer is required to visit the cooperative with which he or she cooperates four times per year. However, 40.7% of the cooperative representatives stated that their officer visited them less than required, while about one-fifth of them (21.6%) indicated that the frequency of visits was higher than prescribed (Table 3). In some cases, these two groups included cooperatives that belonged to the same extension service: for example, three cooperatives from Kruševac stated that they were visited by extension officers less than four times per year, while one cooperative from that territory had more than four visits. This implies that better coordination at the service level is needed in order to fulfill the stipulated criteria and provide an adequate level of service to all cooperatives.

Table 3. The frequency and quality of cooperation between AC and AES.

Variable	Frequency	%
The existence of cooperation with AES		
<i>Cooperate</i>	194	88.2
<i>Do not cooperate</i>	26	11.8
Total respondents	220	100.0
Length of cooperation*		
<i>Less than 6 months</i>	32	16.5
<i>6 months to one year</i>	39	20.1
<i>One to two years</i>	42	21.6
<i>More than two years</i>	81	41.8
Frequency of visits from extension officers*		
<i>Not applicable because I have been working with AES for less than 6 months</i>	29	14.9
<i>Less than four times per year</i>	79	40.7
<i>Four times per year</i>	44	22.7
<i>More than four times per year</i>	42	21.6
Frequency of using AES services*		
<i>Not applicable because I have been working with AES for less than 6 months</i>	13	6.7
<i>Less than once a month</i>	26	13.4
<i>One to three times per month</i>	35	18.0
<i>Whenever I need advice</i>	92	47.4
<i>Not applicable</i>	28	14.4
Total respondents	194	100.0

*Only respondents who stated that they cooperated with AES were included. The total number of these respondents was 194.

Source: Authors' calculation.

The arrival of extension officers to the cooperative office is not the only form of cooperation between these organizations. Contacts can also be made on AES premises, at group meetings, or through the mass media. It is extremely significant that almost half of the cooperatives that had contact with AES considered that they received advice every time they needed a certain type of help. As many as 18.0% of the respondents stated that they had contact with extension officers several times a month, while a significant part of these contacts occurred through group extension methods.

In addition to providing extension services to direct users, extension officers prepare various materials that are available to all interested persons, whether or not they have direct contact with the service. These activities are included in the provision of extension services using mass media communication methods and are one of the basic techniques for increasing the information level of the entire population on selected topics and can also be an important initiator of the extension process.

The largest number of cooperative members reported using applications that provided them with market information, such as STIPS and Agroponuda (Table 4). The focus of agricultural cooperatives is on primary agricultural production, the lack of engagement in food processing and loose ties with the processing industry result in an increased need for information on the possibilities of marketing agricultural products. This situation provides a more vivid insight into the possibilities and limitations of the business of cooperatives than the quality of agricultural extension services.

The AES portal is used as a source of information by 20.0% of respondents, which is more compared to similar surveys conducted in Serbia. Dimitrijević and Stojić (2019) have found that about half of the respondents use different sources of information, such as radio and television, the local agricultural pharmacy, contact with other producers, and that only 15% read specialized magazines or consult an extension officer. At the same time, cooperatives should be a significant source of data. The task of agricultural cooperatives is not only to connect agricultural producers, but also to pool knowledge and information. At the end of the 20th century, it was recognized that cooperatives had valuable knowledge on the supply of inputs and the demand in the market for agricultural products, especially if they were specialized in one line of production (Van Den Ban, 1993). Today, the European Union insists that cooperatives should be organized regionally and used as a tool for marketing agricultural products, especially through direct contacts between producers and consumers (EU SCAR, 2015).

A significant part of cooperative members (41.2%) had no objections to the work of the extension service. Slightly less than one-fifth of the surveyed farmers pointed out that the topics analyzed by AES were poorly focused on the cooperative sector, and the same number believed that communication between

these organizations was insufficient. This is consistent with previous findings that the frequency of visits by extension officers to cooperatives is insufficient.

Table 4. Selected indicators of the quality of extension services for agricultural cooperatives and possibilities for their improvement.

Variable	Frequency	%
Used materials/applications		
<i>STIPS</i>	66	30.0
<i>Agroponuda</i>	51	23.2
<i>Bulletin of AES</i>	44	20.0
<i>PIS Vojvodina (Forecasting and reporting service)</i>	12	5.5
<i>None of the above</i>	47	21.4
Total respondents	220	100.0
What aspects of agricultural extension work do you criticize?		
<i>I have no objections</i>	80	41.2
<i>They are not able to meet the needs of cooperative members</i>	38	19.6
<i>Low level of communication between AES and cooperative members</i>	34	17.5
<i>Lack of topics interesting to cooperative members</i>	31	16.0
<i>Other</i>	11	5.7
What would you improve in the work of AES?		
<i>Higher level of communication (more frequent visits to the cooperative, greater interest, etc.)</i>	67	34.5
<i>Selection of topics according to the needs of cooperative members</i>	61	31.4
<i>More presence of cooperatives in media used by extension officers</i>	42	21.6
<i>Other</i>	24	12.4
Total respondents	194	100.0

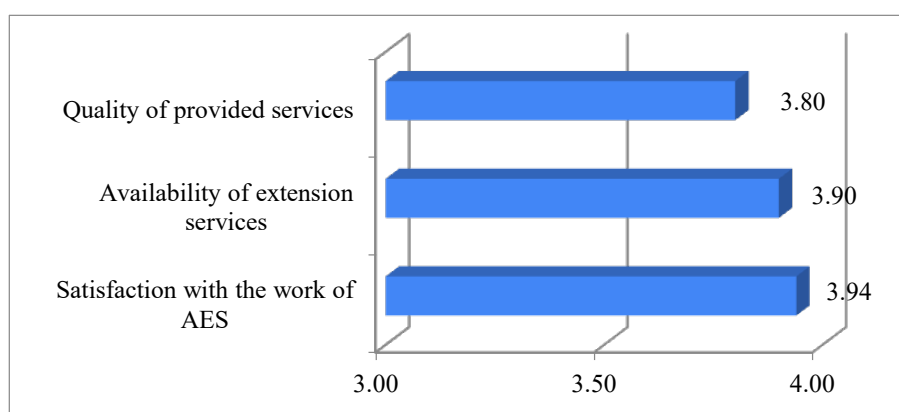
Source: Authors' calculation.

Recommendations that respondents gave to improve AES were to solve the aforementioned problems: more contacts between AES and AC, more attention to topics of interest to cooperatives, and more space in mass media focused on the work of cooperatives. This can be significant not only to the work of AES, but also to the overall promotion of association of farmers. Raising awareness of the general and rural population about the work of cooperatives is proclaimed according to the fifth basic cooperative principle, which combines education, training, and information and is carried out to create a conducive environment for the work of cooperatives and promote their achievements and results (Nikolić et al., 2021).

One of the models for providing extension services is organizing extension networks by farmers' associations or cooperatives. In such a way, an alternative extension service is created, which is primarily aimed at different forms of farmers' organizations. Such organizations have an important role and can be major drivers

of food system change (Dunning et al., 2012). However, for cooperatives to be able to support such an initiative, they need to reach a certain size, both in terms of number of members and available financial resources. From this point of view, the situation in Serbia is extremely unfavorable – cooperatives are predominantly micro or small enterprises, with a modest number of members. Over 50% of potential members do not see any significant advantages in joining a cooperative and therefore do not join these organizations (Simonovic et al., 2019). Currently, there is neither an initiative nor an opportunity to implement this form of extension services in Serbia since farmers' organizations are relatively weak, their representativeness is low, and they do not have sufficient resources to finance an independent extension service (Dimitrijević and Stojić, 2019).

Despite the mentioned shortcomings, the surveyed cooperative members showed a high degree of satisfaction with the work of AES, which they rated with an average score of 3.94. Other scores for the quality of given advice (3.80) and the availability of AES (3.90) are in line with previous findings. The lower scores for the quality of extension work can be linked to the shortcomings pointed out by the respondents, which are related to the low representation of topics of interest to the cooperatives. The availability of extension services would be rated higher if the frequency of their visits to agricultural cooperatives increased. Namely, more frequent contacts between extension officers and farmers are important to improve the efficiency of extension services, leading to higher user satisfaction (Elias et al., 2016; Sarnaik et al., 2020).



Graph 1. Scores of the cooperative members for the work of AES.

Similar findings were reached in other research. The availability of extension services is generally rated as satisfactory, but the variety of services provided is not adapted to the needs of farmers (Debnath et al., 2016; Kassem et al., 2021). It is evident that the quantitative elements of the cooperation between AES and AC,

reflected in the number of visits and contacts, can be further improved, but it would be preferable to focus on diversifying the advice provided, or in other words, on a qualitative approach. Petrović and Janković (2002) point out that changes in the program and organization of the work of extension stations are key factors for their better and more efficient work.

Using the Pearson's correlation coefficient, it was found that there was a weak positive relationship between the level of respondents' education and the rating of extension services availability ($r=0.2474$), the quality of the advice given ($r=0.2454$) and the degree of satisfaction with AES work ($r=0.2554$). The respondents with a higher level of education rated the mentioned indicators with a higher score. At the same time, there is no correlation between the scores given by the respondents and their characteristics (gender, age, place of residence, length of cooperation with AES, frequency of visits by extension officers).

This is contrary to other studies that found that the socio-demographic characteristics of respondents (gender, age, level of education, farm size, and number of cultivated plots) significantly affected their level of satisfaction with extension services (Agholor et al., 2013; Sarnaik et al., 2020). Younger farmers were also found to be more satisfied with the services they received than older farmers (Wayne et al., 2014). As a possible explanation, the authors state that younger producers do not insist on individual visits by extension officers, unlike older ones who consider this method the only reliable one. However, our study focuses on group methods (implemented with agricultural cooperatives), and the obtained results can be explained by the fact that cooperative members with a higher level of education are more willing and able to obtain the necessary information on their own, so they do not need help from AES.

Conclusion

The paper examines a special segment of agricultural extension work that focuses on cooperation with agricultural cooperatives. The research is based on the responses of the cooperative members about the existence, quality, shortcomings and opportunities for improving the cooperation between agricultural cooperatives and AES. The basic assumption of the paper is that some level of cooperation already exists between AES and agricultural cooperatives and that cooperative members perceive it as useful for improving their agricultural production.

The obtained results show that a significant part of cooperative members (88.2%) cooperate with AES, which is more compared to the total population of farmers. This further indicates that there are certain connections between these organizations, partly due to the legal regulation that obliges the extension service to provide services to cooperatives and is a good basis for the implementation of group extension methods, which are increasingly insisted upon. Although they

rated the availability and quality of extension services relatively well, the criticisms of cooperative members of the work of AES were directed primarily at the unadjusted structure of the extension services and their poor compatibility with the needs of cooperatives.

Based on the conducted research, it can be concluded that there is a long-term and relatively stable cooperation between AES and AC, but the quantity and quality can be improved. Further research should be focused on models to improve existing cooperation, but also on developing methods and studies to measure the impact that the extension services provided have on increasing agricultural production.

One of the ways to solve the observed problems is to involve agricultural cooperatives more in the creation of extension work, so that the needs of the cooperatives can be taken more into account. This is in line with European experience but requires strong and representative cooperatives that are respected not only by AES, but also by other competent institutions.

The second model also relies on empowering agricultural cooperatives, which could be implemented in two phases. In the first phase, which is already underway in Serbia, close links are established between AES and cooperatives in order to increase the membership and strengthen the market position of these organizations. Empowered agricultural cooperatives would then have better insight into the needs of their members and would be able to provide them with appropriate extension services, either by hiring external extension officers or by developing their own extension service. In this way, a higher quality of the extension services would be provided to cooperatives, and the existing AES could redirect its services to other potential users.

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SARADNJA POLJOPRIVREDNE SAVETODAVNE SLUŽBE I ZADRUGA –
STANJE I MOGUĆNOSTI

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R e z i m e

Jedna od ključnih karika u sistemu transfera znanja i informacija u poljoprivredi Srbije su savetodavne službe, koje učestvuju kao posrednik između naučnih institucija i različitih grupa korisnika. Cilj ovog rada je da se ispita kvalitet saradnje između poljoprivredne savetodavne službe i zemljoradničkih zadruga u Srbiji, kao i da se sagledaju stavovi poljoprivrednika, članova zadruga, prema uspehu ove saradnje. Za potrebe istraživanja sprovedeno je anketiranje 220 ispitanika, članova zemljoradničkih zadruga. Utvrđeno je da preko 80% zadrugara ostvaruje saradnju sa savetodavcima, pri čemu su u većoj meri zadovoljni kvantitetom savetodavnih usluga, u odnosu na kvalitet. Preko polovine ispitanika smatra da je savete potrebno prilagoditi potrebama zadruga, odnosno posvetiti više pažnje zadrugama u medijskim nastupima savetodavaca. Ovo istraživanje pruža važan uvid u formu saradnje i specifičnosti rada poljoprivredne savetodavne službe sa zemljoradničkim zadrugama, na osnovu čega se mogu predložiti mere za njihovo kontinuirano unapređenje.

Ključne reči: poljoprivredna savetodavna služba, zemljoradničke zadruge, stavovi poljoprivrednika, saradnja.

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