RESEARCH ON THE ATTITUDE OF YOUNG PEOPLE REGARDING THE ATTRACTIVENESS OF AGRICULTURE: A CASE STUDY OF SERBIA

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ABSTRACT

Agriculture plays a crucial role in any economy. However, agricultural work is often regarded as unpopular, dirty and lacking prestige. As a consequence, young people frequently migrate from rural to urban areas in search of alternative activities. This study addresses the challenge of integrating youth into the agricultural workforce. The objective is to assess the reasons behind youth's (un) willingness to engage in agricultural work, using Serbia as a case study. Data were collected through a questionnaire and 308 responses were analyzed with the help of Binary Logistic Regression. The findings indicate that the attitude of young individuals to engage in agricultural work is significantly shaped by area of residence, family involvement, ownership of rural property, the economic viability of the agricultural sector and concerns about long-term employment stability. A few positive and negative stereotypes were also identified. The findings underscore the imperative to attract young people to work in agriculture.

Introduction

The present circumstances give rise to numerous questions about the survival of humans globally. Ensuring an adequate food supply has become imperative due to the ever-growing human population. The agricultural sector is of paramount importance as it facilitates food production, significantly alleviating the widespread issues of hunger and poverty. Many countries, as part of their national economic policies, consider agriculture a cornerstone for their future development (Milić et al., 2023). It profoundly impacts the macroeconomic indicators of each country, particularly the gross domestic

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product (GDP) (Vučkovski et al., 2022). Notably, agriculture contributes 4% to the global GDP, according to the latest World Bank data (World Bank, 2023). In Serbia, data from the Republic Institute of Statistics indicates that agriculture constituted 6.29% of the GDP in 2021 (Statistical Office of the Republic of Serbia, 2022). Over the past decade, its contribution was at its lowest in 2019 (5.95% of GDP) and reached its peak in 2011 (7.45% of GDP), underscoring the substantial role of agriculture in Serbia's economic structure. However, this hasn't always been the case, particularly in the early years of the new millennium when agriculture in Serbia faced challenges due to neglect by economic policymakers (Ljubojević et al., 2022).

It is a well-known catchphrase that the world belongs to the young. Franklin D. Roosevelt stated on several occasions that the future of the nation lies in the hands of the youth. They must not be neglected, as nations deteriorate faster without their involvement. Young people should be the backbone of economic transformation in countries. To realize their role and bring about positive changes in society, young people must assert themselves and receive state support. National governments worldwide have recognized the importance of this sensitive category for their future prosperity. Although numerous youth empowerment programs have been developed, a lot of them have not sufficiently stimulated young people's engagement (Genovez et al., 2022; Chipfupa & Tagwi, 2021; Girdziute et al., 2022; Quijano-Pagutayao et al., 2020; Mulema et al., 2021; Bagshaw & Maddison, 2022; Kusi, 2022; Duah, 2021; Akrong & Kotu, 2022; Dedieu et al., 2022; Geza et al., 2021). This situation arose due to the wrong orientation of these programs. Most of them are focused on understanding the reasons behind young people's poor performance in solving social issues rather than on ways to contribute to social betterment. Recognizing this gap, many global youth education programs have been initiated with the aim of better informing young individuals and helping them acquire the necessary knowledge and skills.

Agriculture is among the sectors where numerous global initiatives have been launched in this regard. This holds true for Serbia as well. A recent example of encouraging young people to engage in agriculture is the project titled „Empowering young farmers to utilize local incentives in agriculture." The initiative for launching and implementing this project was a joint effort by the Center for Sustainable Agriculture and Rural Development and the Association of Young Farmers of Serbia. Their collaboration led to the creation of a platform where young farmers can access comprehensive information about public calls and active support programs related to agricultural and rural development policies. This platform has proven highly beneficial for young individuals aspiring to work in the agricultural sector. Opting for an agricultural profession presents a significant challenge for them, given the numerous obstacles they face, including limited financing options, a lack of experience and knowledge, and high initial production costs. These programs have unveiled a new dimension in young people: their creative spirit and eagerness to adopt innovative and sustainable agricultural practices.

To reshape young people's perceptions of agriculture, a shift in their value system is imperative. This assertion is based on analyses focused on understanding the views of young individuals regarding agriculture at present. This study deals with the factors influencing the willingness or unwillingness of young people to engage in agricultural occupations, with a special focus on Serbia, particularly in its southeastern parts, as a representative case. To conduct this research, a survey questionnaire was distributed among the young population in Southeastern Serbia from May to September 2023. Our primary goal was to identify the factors that affect the desire of young people to engage in agriculture. Other goals include: 1) developing a BLR model that yields good results on new respondents; 2) discovering the stereotypes present among young people regarding agricultural work; and 3) providing recommendations that may be important to the government, farmers, the scientific community, and practitioners. The analysis presented here holds relevance for economic policymakers, agricultural professionals, and the academic community, offering insights for devising innovative strategies to effectively integrate young people into the agricultural workforce.

Considering all that was previously mentioned, the paper is structured as follows: following the introductory section, the first part provides a review of prior studies exploring this topic. The second part delves into the sample of respondents and the research methods used. The third part presents the research results, while the final section addresses concluding considerations and recommendations that may be useful to economic policymakers, the academic community, and other important stakeholders.

Literature review

Examining the collective awareness of the young population for employment in the agricultural sector is increasingly attracting the attention of the academic community and economic policy makers of different countries. This issue is prominent in a significant number of research studies. Many of them are more recent, which indicates an increase in the interest of the young population in agricultural occupations.

The opinion of young people regarding agricultural occupation is the subject of the following research study (Prasetyaningrum, Ruminar, Irwandi, 2022). In it, students of the Faculty of Agriculture of Brawijaya University in Indonesia were examined. For the purposes of the analysis, a survey questionnaire was used. For the purposes of the analysis, the factors of the internal (personal attitudes, stereotypes, hopes, focus, personal improvement, aspirations and interests, experiences) and external environment (family environment, availability of information, support of the organization where the individual works, ability to communicate with others at work) were considered. place). The results obtained in the work show that among the young population there is a moderate interest in working in agriculture. Individual and environmental factors (ecological factors) contributed significantly to this. In addition, almost half of the surveyed students believe that the low income in the agricultural sector is one of the reasons that deters them from choosing agriculture as their future profession.

A subsequent research study deals with the key competencies that are necessary for young people to work in the agricultural sector (Hendrix, Morrison, 2018). The research was conducted on students of the Faculty of Humanities. It is a faculty that is part of the Mississippi State University in the United States of America. A survey, in which the set of skills was specified, was used for the purpose of the research. The statistical data obtained indicate that the key competencies refer to: independence in work, loyalty, and behavior that implies a high degree of responsibility in the performance of work duties and respect for colleagues at the workplace.

The central question posed in the following research study is: does working in agriculture provide a solid income that enables a normal life (Agumagu, Ifeanyi-obi, Agu, 2019). For these purposes, the analysis was conducted on final year students of the Faculties of Agriculture located within the University of Port Harcourt and the State University of Science and Technology. The survey technique was used for data collection purposes. The results obtained through the application of descriptive statistics showed a great interest of young people in working on agricultural jobs. This is supported by the numbers, where as many as 73% of them expressed their willingness to choose agriculture as their future vocation. The study concludes that the main obstacles standing in the way of this are the following: insufficient support from state authorities in providing initial capital, the inaccessibility of agricultural land and the unfavorable price of agricultural mechanization.

The focus of the following research study is directed towards the analysis of the effects of education of the young population on the selection of agriculture as a future professional career (Omotosho et al., 2020). For the purpose of data collection, a survey questionnaire was prepared. It was distributed to the final year students of the college which is part of Landmark University in Nigeria. Descriptive and chi-square statistical analysis was applied to collected data. The results of the paper point to a high percentage of young people who want to engage in agricultural occupations (64%). In addition, there is a higher percentage of those who want to deal with it in their final years.

The following research study (Fazidah et al., 2021) deals with the consideration of the factors that influence the attitudes of students of state agricultural universities in Malaysia regarding the choice of agriculture as a future occupation. For the purposes of obtaining data, a questionnaire was used that was distributed to students. The resulting results indicate the low interest of young people in agricultural education. The reasons should be sought in the insufficient attractiveness of the training available to students and the insufficient connection of the faculty with the agricultural sector of Malaysia.

The issue of integrating the young population into the active agricultural workforce is the focus of the following research study (Girdziute et al., 2022). For the purposes of the analysis, the young population of Lithuania was taken as a sample. Surveys were distributed to a sample of respondents in which their perceptions regarding the central issue were grouped into three groups: individual, economic and social. The results of the research indicate a significant reluctance of young people to work in the agricultural sector.

In (Twumasi et al., 2019), the authors analysed the factors affecting the attitudes of young population regarding their determination to work in the agricultural sector of Ghana. For the purpose of the research, the technique of descriptive statistics and the model of double obstacles were used. The results of the work suggest that there are numerous obstacles standing in the way of young people who want to engage in agriculture. The key ones are those related to insufficient initial capital for starting an agricultural enterprise, high cost of input inputs, insufficient capacity for accommodation and storage of agricultural foodstuffs, unfavorable agricultural loans and poor understanding of the needs of farmers by the state.

The research study (David et al., 2022) examines the factors that create an environment for farming among the young population. The analysis includes final year students of the Faculty of Agriculture in the Visayas Islands that belong to the Philippines. The results of the work indicate that there is a lack of interest among young people in engaging in agriculture after completing their studies. In addition, there is an increasing percentage of those who do not enroll in studies at the Faculty of Agriculture because they have no intention of pursuing this vocation. Low income from agricultural work is the main obstacle that deters the young population from this occupation.

In (Akrong, Kotu, 2022), the authors tried to identify the key factors influencing the degree of involvement of the youth population in the agribusiness activities of Benin. For the purposes of the research, a survey questionnaire was used, which was distributed to young people aged 18 to 25 years. The findings indicate that the male population is more interested in doing agricultural work. In addition, they are more likely to come from families that have more members, which are less educated. The authors conclude that youth in Benin should be stimulated to engage in agriculture in various ways. Spreading awareness about the positive aspects of this branch of the economy, strengthening the capacity of young people through the organization of training programs in this area, and a package of stimulating state measures are the key issues that must be addressed by Benin's economic policy holders in the coming period.

A subsequent research study examines the attitudes of Jawaharlal Nehru Krishi Vishwa Vidyalaya college students in India about a program of youth involvement in rural agriculture (Khatri et al., 2023). For the purpose of the analysis, a questionnaire was used. It was distributed to graduated students, who had previously attended a program to support young people in agriculture. The obtained results indicate that a small number of students were previously familiar with that program. In addition, the findings indicated the existence of a relationship between thirteen variables concerning their perceptions of this program. The same cannot be said for the age structure dimension, which did not show interdependence with their view of this program.

Examining the opinion of young people in Spain regarding their perspective in the agricultural sector is the focus of the next research study (Pollnow et al., 2023). The results obtained in the work showed that Spain's agriculture is faced with the problem of a lack of youth. This is a consequence of moving to urban areas where they can find

better jobs. In addition, the paper indicated that it was more difficult for the young population to decide to build their career in the agricultural sector for the following reasons: difficult access to initial capital for starting a business in this sector, insufficient education, as well as limited access to land.

Consideration of the factual situation in Hungary's agricultural sector is the focus of the following research study (Finta et al., 2020). The paper indicated that the biggest problem of agriculture in this country is the unfavorable age structure. This sector is unpopular within the young population due to difficult working conditions and the opportunities it provides in terms of income. One of the aggravating circumstances for the young population is the lack of knowledge regarding starting agricultural activities.

Analysis of the influence of the environment on the choice of an agricultural occupation by the young population is the focus of the author in (Kandula, 2021). The research was conducted among young people in the Indian state of Telangana. The obtained data drew attention to the fact that the family and society itself have the greatest influence on the choice of an agricultural occupation by young people.

Identifying factors influencing the selection of agricultural occupation by students of Ekiti State University, Nigeria is the subject of the following research study (Abayomi et al., 2015), where 160 students participated in the research and questioned through interviews. The results of the paper indicated that most of them are ready to work in agriculture. At the same time, they perceive agriculture as a springboard for further advancement in their career. In general, the key obstacles that stand in the way of their longer engagement in the agricultural sector are insufficient financial allocations, limited access to land and prejudices regarding the quality of agricultural land and livestock.

Theory and methodology

The research conducted in this paper is based on Binary Logistic Regression (BLR), a statistical method commonly used to model the relationship between a binary dependent variable and one or more independent variables. This method is widely applied to solve classification problems when the target variable has only two possible outcomes, usually labeled as 0 or 1. Outcomes labeled as 0 represent the "fail," "no," "false," etc., while outcomes labeled as 1 represent the "pass," "yes," "true," etc. Independent variables (predictors) can be either continuous or categorical. The effects of the independent variables on the dependent variable reflect the probability of the occurrence of an event within a given category of the dependent variable (Nayebi, 2020).

Logistic regression is based on the logistic function, an S-shaped curve that transforms any continuous value into a probability, always ranging between 0 and 1 (Pampel, 2020). If the estimated probability surpasses a predefined threshold (usually 0.5), the model predicts that the instance belongs to a particular class. The main assumptions of logistic regression are: a) predictors exhibit a linear relationship with the log of the output variable; b) non-collinearity between predictors, meaning that the explanatory variables are independent of each other; c) the output variable is binary; and d) a large sample size.

The logistic regression model can be expressed as:

$$\log\left(\frac{p(X)}{1-p(X)}\right)=\beta_0+\beta_1\cdot X_1+\cdots+\beta_p\cdot X_p \qquad (1)$$

, where $X=(X_1,\ldots, X_p)$ are p predictors or independent variables, β_0 is the intercept term, and $\beta_0, \beta_1,\ldots, \beta_p$ are coefficients. The interpretation of logistic model coefficients usually involves their exponentiation, which allows them to be understood as odds ratios (Hilbe, 2015). The quantity $p(X)/(1-p(X))$ is called the odds ratio and can take any value between 0 and ∞. The left-hand side of equation (1) is called the log odds, or logit, and is linear in X. Equation (1) can be rewritten as:

$$p(X)=\frac{e^{\beta_0+\beta_1\cdot X_1+\cdots+\beta_p\cdot X_p}}{1+e^{\beta_0+\beta_1\cdot X_1+\cdots+\beta_p\cdot X_p}} \qquad (2)$$

where $\beta_0, \beta_1,\ldots, \beta_p$ are coefficients estimated using maximum likelihood. The likelihood function can be written as:

$$1\left(\beta_0+\beta_1\cdot X_1+\cdots+\beta_p\cdot X_p\right)=\prod_{i:y_i=1}p(x_i)\prod_{i':y_{i'}=0}\left(1-p(x_{i'})\right) \qquad (3)$$

and the estimates $\beta_0, \beta_1,\ldots, \beta_p$ are chosen to maximize this likelihood function.

For the purpose of this research, data were collected using a questionnaire. All respondents were divided into a training group and a test group and accordingly labeled. Our target binary variable, codenamed agri_like, represents youth's willingness to work in the agricultural sector. It is based on the question: Would you like to work in the agricultural sector? Those who would like to work in the agricultural sector were labeled as 1. Other respondents were labeled as 0.

As for the independent variables, the following socio-demographic characteristics, coded as dummy variables, were considered: gender (variable name: gender), age (variable name: age), area of residence (variable name: resid_area), family members engaged in agriculture (variable name: family_memb), relatives or friends engaged in agriculture (variable name: cousin_friend), student status (variable name: student), and work status (variable name: employed). In addition, as proposed by Magagula & Tsvakirai (2020), three separate groups of statements related to agricultural work were developed and given to respondents. These statements were developed with the understanding that: 1) certain stereotypes regarding agricultural work do exist, and 2) answers to these questions should reveal different individual, economic, and social perceptions of the respondents. For the purpose of the analysis, answers were ranked on a Likert scale (1 = totally disagree; 2 = disagree; 3 = do not have an opinion; 4 = agree; 5 = totally agree). In total, 31 variables (24 perception variables and 7 socio-demographic variables) were considered for this research. A detailed explanation of all variables can be found in Table 1.

Table 1. Independent variables

Socio-demographical variables	
gender	dummy variable: 1 = male, 0 = female
age	continuous variable
resid_area	dummy variable: 0 = rural, 1 = urban
family_memb	dummy variable: 1 = yes, 0 = no
cousin_friend	dummy variable: 1 = yes, 0 = no
student	dummy variable: 1 = yes, 0 = no
employed	dummy variable: 1 = yes, 0 = no
Perception variables	
Variable	Statements (measured on Likert scale)
Individual variables	
youth_agri	Young people should work in agriculture
my_own_farm	I would choose to work in agriculture if I had my own farm/real estate in the countryside
nature_animals	I would like to work in agriculture because I love nature and animals
abroad	I would choose to work in agriculture only abroad
circumstances	Under no circumstances would I choose to work in agriculture
educat_motiv	Specialized educational programs would motivate me to work in agriculture
Economic variables	
seasonal	Agricultural work is mostly seasonal
self_realization	Agriculture does not provide opportunities for self-realization
profitable	Working in agriculture is profitable
signif_role	The agriculture sector ranks well because of its significance
perspective	Agricultural work has no perspective
fin_resources	Modern farmers have significant financial resources at their disposal
tech_innovations	Thanks to technological innovations, work in agriculture is becoming more and more attractive
steady_job	Agricultural jobs are not secure in the long term
Social variables	
physical_effort	Agricultural work requires a lot of physical effort
dirty	Agricultural work is dirty
unpopular_work	Agricultural work is not popular
responsibility	Agricultural work requires great responsibility
unskiled_workers	Agricultural jobs are intended for unskilled workers
lifestyle	Agricultural work is becoming a life-style
nat_environment	Working in agriculture means being surrounded by nature
social_shortcomings	The social life of young people in rural areas is incomplete and full of shortcomings
flex_schedule	Work schedule in agriculture is flexible
urban_rural_diff	There is a difference between urban and rural lifestyle

Source: author's own account

Our sample consists of 308 respondents. All respondents represent Serbian youth, ages 19–30. Data gathered from 215 randomly chosen respondents (or 70% of the total number) were used to build and train a BLR model, while the remaining 93 respondents

(or 30%) were used to test our model. The whole analysis was conducted in Python v3.9 (packages: pandas, numpy, matplotlib, seaborn, sklearn, and statsmodels) and SPSS v26.

Before delving into the development of our BLR model or any other form of analysis, addressing the issue of multicollinearity is essential. Multicollinearity exists when there is correlation between predictors in the model, and its presence can adversely affect regression results. In this paper, testing for the presence of multicollinearity was based on Variance Inflation Factors (VIF). VIF estimates how much the variance of a regression coefficient is inflated due to multicollinearity in the model. VIFs are calculated for each predictor by regressing it against every other predictor. This yields R-squared values, which are then used in the VIF formula: $VIF=1/(1-R_i^2)$. The threshold at which a VIF value causes issues is a subject of debate. However, it is known that as the VIF increases, the reliability of the results decreases. Generally, a VIF above 10 indicates a high correlation and is cause for concern.

Finally, for evaluating our training model, standard statistical measures were used: Accuracy, Precision, Recall, and F1 score. Accuracy is a simple measure, indicating the percentage of correctly classified instances out of all instances. Precision measures the proportion of true positive predictions out of all positive predictions. Recall measures the proportion of true positive predictions out of all actual positive cases. The F1 score is the harmonic mean of precision and recall. It combines the two metrics to provide a more balanced evaluation of the model's performance.

Results and discussion

The target population for this research comprises young people in Serbia aged 19-30. The main survey was conducted from May 2023 to September 2023, with a total of 308 questionnaires completed and analyzed. Descriptive statistics for the respondents' main sociodemographic characteristics are presented in Table 2.

Table 2. Respondents' socio-demographic profile (N = 308)

Variable	N	%
Gender		
Male	106	34.41%
Female	202	65.59%
Age		
19-24	285	92.53%
25-30	23	7.47%
Area of Residence		
City	226	73.37%
Village	82	26.63%
Family members engaged in agriculture (Yes)	85	27.59%
Cousin/Friend engaged in agriculture (Yes)	164	53.25%
Student (Yes)	170	55.19%
Employed (Yes)	22	7.14%

Source: author's own account

According to our data, there are almost twice as many females than males among the respondents. Most of our respondents (92.53%) are in the age group 19-24 and live in urban areas (73.37%). 27.59% have a family member engaged in agriculture, while 53.25% have a cousin or friend engaged in agriculture. Over half of our respondents are students (55.19%), and only 7.14% are employed.

The youth's motivation to work in agriculture was also analyzed with the help of responses collected through a Likert scale. The results can be summarized as follows: Nearly 90% of respondents agreed, or totally agreed, that agricultural labor is difficult and requires great responsibility. About 84% thought that the social life of young people in the countryside is full of shortcomings, and nearly 77% believed that there is a difference between urban and rural lifestyles. As many as 85% believed that the earnings brought by working in agriculture were inadequate. Also, the great majority stated that agriculture is unpopular but is becoming more attractive thanks to technological innovations. Half of the respondents agreed that agricultural work is dirty but offers perspective and opportunities for self-realization. Approximately one-third of the young people would like to engage in agriculture, but on the assumption that they own a farm or property in the countryside, while 40% felt indifferent. Over 70% of the respondents believed that educational programs and being surrounded by nature and animals were important motivational factors. It is worrying that only 44% consider that the agricultural sector has an important role. Only 13% of the respondents would not work in agriculture under any circumstances, and very few of the respondents would like to go and work abroad. The results also showed that one-quarter of the respondents did not have any opinion on whether young people should work in agriculture or not.

The next part of our research is dedicated to addressing the problem of multicollinearity. To tackle this issue, we utilized Variance Inflation Factors (VIFs). As there is no consensus on the threshold beyond which a variable should be excluded from further research based on its VIF score, we chose not to include variables with a VIF value greater than 10. Initially, we calculated VIFs for all predictors. Subsequently, we iteratively dropped the variable with the highest VIF score and recalculated VIFs for the remaining variables until each had a VIF score lower than 10. After accounting for multicollinearity, we were left with 16 mutually independent variables. Fifteen variables excluded due to multicollinearity are: age, responsibility, nat_environment, physical_effort, educat_motiv, social_shortcomings, nature_animals, seasonal, urban_rural_diff, youth_agri, signif_role, tech_innovations, unpopular_work, lifestyle, and circumstances. VIF scores for the remaining variables can be found in Table 3.

Table 3. VIF scores of the remaining variables

Variable	VIF score	Variable	VIF score
gender	1.639754	self_realization	3.757275
resid_area	3.875567	profitable	5.442730
student	2.854216	perspective	8.279385
employed	1.409746	fin_resources	9.071339
family_memb	2.010011	dirty	9.573634
cousin_friend	2.682503	steady_job	9.237504

Variable	VIF score	Variable	VIF score
my_own_farm	8.607208	unskiled_workers	6.757233
abroad	6.681982	flex_schedule	7.351926

Source: author's own account

These remaining variables were used to develop our train model, which is presented in Table 4.

Table 4. BLR model (train sample data). Logistic Regression Results

Dep. Variable:		agri_like	No. Observations:				215
Model:		Logit	Log-Likelihood:				-67.242
Method:		MLE	LL-Null:				-130.91
converged:		True	LLR p-value:				7.060e-20
Omnibus Tests of Model Coefficients:		χ^2 = 163.570 p = 0.000	Cox & Snell R^2: Nagelkerke R^2:				0.533 0.710
Variables	Coef (log odds)	std err	z	P>|z|	CI 0.025	CI 0.975	Odds Ratios
gender	-0.2080	0.479	-0.434	0.664	-1.147	0.731	0.812
resid_area	-2.2080	0.487	-4.538	**0.000**	-3.162	-1.254	**0.109**
student	0.7274	0.529	1.375	0.169	-0.309	1.764	2.069
employed	1.0179	0.957	1.064	0.287	-0.857	2.893	2.767
family_memb	1.8543	0.540	3.434	**0.001**	0.796	2.912	**6.387**
cousin_friend	-0.8227	0.544	-1.511	0.131	-1.890	0.244	0.439
my_own_farm	0.7904	0.216	3.656	**0.000**	0.367	1.214	**2.204**
abroad	-0.5535	0.238	-2.330	**0.020**	-1.019	-0.088	**0.574**
self_realization	-0.2281	0.210	-1.087	0.277	-0.640	0.183	0.796
profitable	0.5388	0.250	2.153	**0.031**	0.048	1.029	**1.713**
perspective	-0.3531	0.253	-1.395	0.163	-0.849	0.143	0.702
fin_resources	0.1402	0.226	0.619	0.536	-0.304	0.584	1.150
dirty	0.1093	0.232	0.471	0.638	-0.346	0.564	1.115
steady_job	-0.4755	0.196	-2.423	**0.015**	-0.860	-0.091	**0.621**
unskiled_workers	-0.2127	0.217	-0.980	0.327	-0.638	0.213	0.808
flex_schedule	0.1131	0.206	0.548	0.584	-0.292	0.518	1.119

Source: author's own account

First of all, according to Omnibus goodness of fit test, the logistic regression model is statistically significant. P-value (p = 0.000) tells us that model is statistically significant and the dependent variable is well predicted. Cox & Snell and Nagelkerke R^2 values are methods of calculating the explained variation. The Nagelkerke modification is considered to be a more reliable measure. In our model, Nagelkerke R^2 accounts for 0.710, indicating that 71% of the relationship between the predictors and the prediction is explained. The accuracy and f1 score of our train model are 84% and 80% respectively.

As we can see from Table 4, there are six statistically significant variables with p-values less than 0.05. Two of them represent socio-demographical characteristics of the respondents: resid_area and family_memb. The next two variables are within respondents' individual beliefs (my_own_farm and abroad). Variables labeled as profitable and steady_job are from the group of economic variables. There were no statistically significant social variables. These six variables have significant influence

on youth' willingness to work in agricultural sector and can be interpreted as follows. Our first variable (labeled as resid_area) has a coefficient value of -2.208 and an odds ratio of 0.109. This negative coefficient value tells us that young people living in urban areas were less willing to work in agricultural sector in comparison to those living in rural areas. We can also say that living in the urban area is associated with a 89.1% reduction (1-0.109) in young people's desire to work in agriculture. According to our second variable (labeled as family_memb), positive coefficient value of 1.85 suggests that youth whose family members were engaged in agricultural activities were more likely to choose the agriculture work as well. Or, in terms of odds, we can say that odds of choosing to work in agriculture are 6.38 times greater for youths who have a family member already engaged in agriculture. From the third variable (labeled as my_own_ farm) and its coefficient value of 0.790, we can conclude that owning a farm or real estate has a positive impact on young people and their desire to engage in agriculture. The odds of working in agriculture for young people increase by 2.2 if they own a farm/real estate in the countryside. Forth variable (labeled as abroad) with a negative coefficient value of -0.55 implies that choosing to work abroad in the agricultural sector has a negative effect on youths' willingness to work in agriculture, in general. It seems that working abroad or domestic in the agricultural sector is not an option for young people in Serbia. Regarding the fifth significant variable (labeled as profitable), its coefficient value of 0.54 suggests that respondents who believed that agricultural engagement is profitable were more inclined to work in agriculture. It was interesting to find out that, although great majority (85%) of respondents agreed/completely agreed that earnings in agriculture are inadequate, the odds of choosing agricultural work for those who believe otherwise were 1.7 times greater. Finally, according to our last variable (labeled as steady_job), the opinion related to agriculture not offering a secure job in the long term can be associated with reduced desire among the young people to work in agriculture. Its negative coefficient value of -0.47 suggests that young people who find agricultural work unsecure, have 38% less odds of choosing agricultural work, compared to those who find it secure. Model evaluation results are presented in Table 5. As we can see from Table 5, indicators obtained from train data are very close to indicators based on test data. There is a small difference in accuracy (2%) and in f1-score (5%). These small differences lead us to the conclusion that we didn't overfit and our model is good.

Table 5. Model evaluation results

Results on train data (215 obs)				**Results on test data (93 obs)**		
	precision	recall	f1-score	precision	recall	f1-score
0	0.88	0.89	0.88	0.89	0.87	0.88
1	0.73	0.72	0.72	0.61	0.64	0.62
accuracy	0.84			0.82		
macro avg	0.81	0.80	0.80	0.75	0.75	0.75
weighted avg	0.84	0.84	0.84	0.82	0.82	0.82

Source: author's own account

Conclusions

The focus of this study was to analyze the reasons behind the youth's (un)willingness to work in agriculture, using Serbia as the case study. With the help of a questionnaire, responses from 308 respondents were collected, and all the goals we set at the beginning of this paper have been met. After addressing the problem of multicollinearity, the BLR model was created, and important variables were identified. Finally, the model was evaluated on new data set to see how well it performs in practice. The results from this research may find practical application in the development of government programs aimed at attracting young people to engage in agriculture.

It should also be noted that the present study has limitations. We could say that our sample is unbalanced since there are twice as many female respondents. Also, most of our respondents live in urban areas and only a small percentage are employed. The next limitation is related to the data collection technique. For the purpose of this research, a closed questionnaire was used to collect only quantitative, easy to process data. There were no open questions, which, although difficult to process, can provide us with meaningful insights. Therefore, a more complex data gathering technique could be carried out in the future.

Summarizing the research results, it can be said that there are both positive and negative stereotypes, with the number of negative ones being higher. As for positive stereotypes, we were able to identify the following: i) educational programs and technological innovations are important and needed, and they can attract young people to agriculture; ii) agricultural work offers a perspective and opportunities for self-realization. On the other side, the negative stereotypes that are present among the youth are: i) the young people thought that agricultural work was unpopular; ii) working in agriculture is not profitable and requires a lot of physical effort; iii) the social life in rural areas is incomplete, and there is a difference between urban and rural lifestyles. These negative stereotypes can be corrected only in the long-term using a variety of measures, such as training, educational programs, etc. Also, we found some of the results to be slightly contradictory. For example, the opinion of the majority of our respondents is that young people should work in agriculture. But, on the other hand, approximately the same majority agreed and completely agreed that, under no circumstances, they would choose to work in agriculture, not even abroad. Having in mind this contradiction, we can say that the majority of young people in Serbia have an opinion that can be expressed like this: It is ok for my peers to be engaged in agriculture, as long as I don't have to.

In addition to the positive and negative stereotypes about agriculture, other important socio-demographic characteristics were identified. The desire to work in agriculture is significantly affected by having family members in this field, as well as the living area. Having a family member engaged in agriculture and living in a rural area positively increases the odds of choosing to work in agriculture. Unlike other authors, we didn't find gender to be a statistically significant variable. Maybe the reason for this is the fact that our sample is imbalanced: there are almost twice as many female respondents then male respondents.

Next, we found that owning a farm increases the odds of engaging young people in agriculture. This is important because not so long ago, the Serbian government introduced a national program that helps people acquire real estate in the countryside. By keeping this program alive for years to come, it will inevitably attract young people to agriculture. Another variable we identified as significant is the profitability of the agricultural sector. This variable is also under the influence of the government. The government could attract more young people to agriculture simply by applying measures that affect its profitability: increasing benefits, investing in infrastructure (roads, canals, etc.), opening new markets (Middle East, China), stimulating diversification, various educational programs, etc. Finally, our research has revealed that long-term employment uncertainty negatively affects youth's willingness to work in agriculture. Promoting steady jobs is a difficult task for any government, not just in agriculture, and definitely not something that can be easily achieved in the short term. Also, other factors not directly under government control, such as technological progress, climate change, and the seasonal nature of agriculture, have a strong influence and must be respected as well.

Now that we know what attracts young people to agriculture, the next step of the research will be to analyze government measures and programs already implemented in the Serbian agricultural sector, but from the aspect of variables we have identified as significant. This will help us determine whether government measures and programs are adequate and whether they are able to deliver results, such as attracting young people to agriculture. Additionally, we could focus on previously identified significant variables and investigate them more thoroughly. We could, for example, explore what is the most preferred way to influence profitability of the agricultural sector or what has the greatest impact on long-term employment uncertainty. Finally, we could deal with the problem of the negative stereotypes and try to answer questions such as: how they arise and where they come from, how widespread they are among young people and what can be done to eradicate them.

Conflict of interests

The authors declare no conflict of interest.

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