AGRICULTURAL UNIVERSITY PLOVDIV
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OPPORTUNITIES AND BARRIERS FOR SUSTAINABLE AGRICULTURAL DEVELOPMENT IN THE REPUBLIC OF SERBIA

(Възможности и заплахи за устойчивото развитие на земеделието в Сърбия)

ABSTRACT
of a dissertation for awarding an educational and scientific degree "Doctor" in a scientific specialty "Organization and management of production "

Plovdiv, 2021

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Reviewers:

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The dissertation was discussed and focused on the defense of an extended meeting of the Department of Management and Marketing at the Faculty of Economics, Agricultural University of Plovdiv.

The defense of the dissertation will take place on ..... 2021 from ..... hours in hall …… .. .

INTRODUCTION

The new era of agriculture requires new, sustainable solutions and technologies, in order to enable producers to produce more, with less investment. Producers, through crop protection with superior seed, genetic seed traits and digital farming tools, are provided with more comprehensive solutions to overcome the obstacles that await them in the future. Sustainable agriculture is becoming crucial in providing enough food for the world's growing population. Sustainable agriculture has the potential to improve both food stocks and protect the environment.

The development of technology (especially ICT) has enabled new solutions in the field of agriculture. The application of ICT enables monitoring and documentation of production, and with the help of an appropriate GIS (Geographic Information System) data processing and workflow management. Precision Agriculture (PA) was defined in the first half of the twentieth century, and it consists in applying inputs in accordance with the needs, ie identified resources and anti-resources. Precision agricultural production is entering the application phase in many areas. Farmers are beginning to be given practical guidance (and those who cultivate smaller areas). [1] When it comes to the problem of harmful and hazardous substances in land, it is essential to establish concepts and harmonize terminology to describe the condition of the land. To assess the land from the sanitary-hygienic aspect, in addition to data on geological and hydrogeological characteristics, it is necessary to analyze the processes of self-purification and migration of pollutants, as well as the microbiological complex of the land.

The paper consists of three parts, an introduction and conclusions.

The introductory part mainly refers to introductory considerations on ecology and sustainable development and the application of advanced technologies in the function of sustainable agriculture.

The first part deals with ecology and sustainable development. Global environmental problems have been defined. Basic concepts of sustainable development, principles and strategies of environmental management are given. Environmental management is defined and models of eco-management are analyzed. This section provides a detailed description of methods and instruments in sustainable development planning. The notion of land as a condition of life is explained and the forms, sources and consequences of land pollution are given. In this part, the research methodology in this paper is given.

The second part of the paper deals with the application of advanced technologies in the field of sustainable agriculture. Innovative solutions in the field of agriculture are given. A new concept of agricultural production has been defined - precision agriculture. The connection between information technologies and precise agricultural production is explained. It is explained how advanced technologies contribute to the improvement of yield and quality. The term GPS is defined.

The third part deals with examining the attitude of users on the applicability of advanced technologies in the function of sustainable agricultural development. A non-parametric statistical procedure for assessing the attitude of the population towards the applicability of advanced technologies in the function of sustainable agricultural development is given. A regression analysis and a forecast of the connection between the attitudes of the respondents and their socio-andragogical characteristics are also given.

The last part covers the conclusions reached during the research, ie the confirmation of the presented hypotheses.

METHODS AND INSTRUMENTS OF ECO-MANAGEMENT IN SUSTAINABLE DEVELOPMENT PLANNING

The growing awareness of the importance of the environment has increased interest in developing methods that would contribute to reducing harmful impacts. International standards (which have also been translated in our country) describe the principles and frameworks for the implementation of environmental

[1] Ludowicz, C., Schwaiberger, R., Leithold, P., (2002), *Precision Farming*, Handbuch für Praxis, DLG-Verlags-GmbH, Frankfurt am Main, p. 76.

protection in compliance with the prescribed minimum requirements. Environmental management is one of the basic tasks of present and future generations.

Ecomanagement has five basic functions: planning, organizing, personnel policy, management and process control. The development of abilities in people who deal with eco-management is conditioned by education and training.

The eco-manager can appear in six roles:

1. Regulator - the behavior of managers is created by others, but it also influences the behavior of others
2. Innovator - managers strive to create change, but also to adapt to the changes caused by others
3. Catalyst - accepted innovations must meet (as much as possible) the requirements for efficiency growth
4. Authorized guardian - management must treat resource consumption sparingly
5. Intermediary - mediates between system requirements and environmental requirements
6. Leader - scientific leadership techniques, but also emotional connection with subordinates to motivate them to perform tasks to the maximum.

Through the Adizes model of the ideal manager, it has been shown that all the necessary qualities can never be found in one person.

The characteristics of the management team are:

- Manufacturer ("master of his craft") - to achieve this he must know all the secrets of his primary profession: technology, marketing, finance or some other areas; besides, he must be aware when he is doing well;
- Manager - it is not enough to know the way in which something is "produced" (especially when it should be done by someone else); must be an excellent manager - a person who plans, coordinates and controls the implementation;
- Entrepreneur - this feature (entrepreneurship) is necessary due to the existence of a dynamic environment in which new opportunities are constantly emerging, but also dangers; the manager must be able to change purposes and strategies, to make quick decisions, which implies a certain risk; he must be able to recognize, predict a new flow of reality and take advantage of it;
- Integrator - integration means the process in which the risk of an individual becomes the risk of a group; the task of the integrator is to find a compromise between the requirements and possibilities of the organization and individuals and thus bring them closer to each other.

The planning process is expressed in extremely complex activities that can leave long-term consequences on a large number of people. Urban management:

- is a set of activities related to physical changes in space that are undertaken in order to improve the quality of life from the economic, environmental and social aspects and increase the efficiency of utilities and other urban functions;
- includes elements of land planning, housing, financing and social development,
- must be based on complete information on the current situation and on the available documentation, and the decisions made are based on the analysis and diagnosis of the current situation,
- enables the creation of a balance between economic, environmental and social development, whose indicators and data should be incorporated into plans and standards,
- articulates the public interest and defines measures for its protection, and directs all possible changes according to the parameters that serve to protect the public interest,
- represents a method of raising funds for the economic valorization of land as a resource and its reproduction and arrangement for the purpose of further more rational use.

Ecomanagement is part of good business practice in all organizations that have a clear strategy and purpose based on continuous improvement of their processes. For organizations involved in sustainable urban planning, it is a challenge and a way to prove and commit to new approaches, new philosophies, new ways of thinking, critical and scientific approach, readiness and ability to change, to abandon half-heartedness and undertake business and other endeavors. with better effectiveness and with the general affirmation of effective practice.

Methods and instruments for environmental management are systematized means for obtaining information on the environment and assistance in making decisions on the environmental performance of current or planned activities in order to protect and improve the environment, ie achieve the purposes of sustainable development. These funds can be used by all social actors (whether from the private or public sector), in all activities and at all levels, from local, regional, national, to international.

In practice, a large number of means of eco-management, ie management of ecologically sustainable development are applied. Some of the instruments are used as a legal obligation, some are standardized at the level of national or international standards and their application is voluntary, and others are in the development and development phase. Methods and tools can be classified in different ways, depending on the interpretation of sustainability.

The basic characteristics of individual methods and instruments are shown in Table 4.

Table 4. Overview of the application of methods and instruments for environmental management in the function of sustainable urban development. Source: Михајловић, П., Ђурић, С., Стошић-Михајловић, Љ., (2008), Управљање расположивим алтернативним енергетским ресурсима у урбаној средини, монографија, Одрживи просторни развој градова, ИАУС, Београд, стр. 188.

Purpose	**Name**	**Description**
Identification and analysis of the state of the environment	Monitoring the state of the environment. Ecological capacity. Ecological footprint.	Collection, interpretation and publication of information on the state of the environment. A measure that indicates the ability of the environment to self-renew. Estimation of the area of land required for human activities in the settlement.
Using information to define policies and actions	Environmental budget allocation. Ecological zoning of space. Environmental sustainability indicators.	Based on the determined ecological capacity, the ecological budget is determined, which is allocated to the users through permits. Separation of space according to similar environmental properties. Animal sustainability indicator system environment based on relations: pressure-state-response.
Assess the effect of policies and actions	Strategic environmental assessment. Environmental impact assessment of investment projects. Environmental risk assessment.	Formalized procedure for assessing the impact of decisions on policies, plans and programs on the environment. Rulebook on analysis of the impact of facilities and works on the environment. Rulebook on hazard assessment methodology.
Action management	Environmental planning and management. Ecomanagement systems.	The problem of identifying environmental problems, defining environmental strategic purposes and developing action plans. Formalized and standardized eco-management systems.
Informing about sustainable development issues	Databases and the Internet.	Publishing data on issues of sustainable development, computer databases, internet and communications.
Creating a social climate for sustainable development	Sustainable development indicators. Healthy and productive life in accordance with environmental requirements.	System of aggregated indicators and indices understandable to the public. Action Program for Sustainable Development of local and national level with participation all interested.

In some approaches to sustainability, the instruments are more technically oriented to determine the ecological capacity of space and the impact of human activities on the environment, while in other approaches, in addition to technical tools, political means play an important role. environmental and development decisions.

Environmental management methods and instruments can be divided into several groups:

1. Identification and analysis of the state of the environment,
2. Use of information for defining policies and actions,
3. Assessment of the effect of policies and actions,
4. Action management and information on sustainable development issues,
5. Creating a social climate for sustainable development.

Strategic environmental assessment can take several forms:

1. Sectoral (strategies for the development of transport, energy, water management),
2. Spatial (assessment of spatial plans at the state, regional and local level),
3. Indirect (environmental evaluation of scientific programs, plans for privatization of public companies).

Forms of strategic environmental assessment are shown in Table 5.

Table 5. Forms of strategic environmental assessment

The shape	**Description**
Sectoral	strategies for the development of transport, energy, water management
Spatial	assessment of spatial plans at the state, regional and local levels
Indirect	environmental evaluation of scientific programs, plans for privatization of public companies, etc.

Source: Михајловић, П., Ђурић, С., Стошић-Михајловић, Љ., (2008), Управљање расположивим алтернативним енергетским ресурсима у урбаној средини, монографија, Одрживи просторни развој градова, ИАУС, Београд, стр. 190.

The scope of strategic environmental assessment includes testing of quality: air, water, land, biodiversity, as well as waste recycling. In addition, it may include multi-source impact assessment (cumulative impact assessment) and social impact assessment.

Cumulative impact assessment takes into account impacts that may be individually acceptable, but cumulatively unacceptable due to accumulation in time and space, synergism, indirect and interactive effects. Social impact assessment includes an assessment of the impact of major projects, programs and plans on the social status of the population, which relates to the health aspect, economic activities, economic status of social groups, political efficiency.

RESEARCH METHODOLOGY

a. Subject of research. The subject of this paper is the analysis and consideration of the concept of ecology and sustainable development, land and the use of advanced technologies in the field of sustainable agriculture, as well as the search for adequate modalities for sustainable agricultural development.

The basic research idea is to investigate and study global environmental problems in as much detail as possible, to study the impact on all areas of sustainable agriculture and to propose methods and techniques for minimizing the harmful consequences for sustainable agricultural development. The idea is to study advanced technologies, to analyze the possibility of their application, and to see how they affect the sustainable development of agriculture.

b. The theoretical approach to the problem of research. Ecology is a biological discipline that studies the relationships, structure and functioning of nature as a whole, including man, or humanity as a specific component of biological systems on Earth. It deals with the relations between living beings and their environment, as well as the mutual relations of all organisms in nature.

Information technologies play an important role in all areas of human activity. One of them is agriculture, where their task is to enable agricultural producers or employees in an organization to collect and use the necessary information as easily as possible, to communicate with other people in the organization (and outside) and thus contribute to making the right decision.

All this leads us to the conclusion that it is necessary to study global environmental problems and advanced technologies in as much detail as possible, in order to accurately see their impact on the sustainable development of agriculture.

c. Research purpose and objectives. The aim of this PhD thesis is the description and classification of ecology and sustainable development and application of advanced technologies in agriculture of the Republic of Serbia. The social aim is to develop awareness of the importance of ecology and sustainable development and the application of advanced technologies in agriculture.

d. Research hypotheses. The basic (general) hypothesis in this research:

H-1: *The application of advanced technologies in the field of sustainable agriculture contributes to the optimization of investments, reduction of losses and maximization of income.*

The character of the general hypothesis thus set requires that it be operationalized through special hypotheses:

H-2: *The advantages of using advanced technologies in agriculture are undoubted.*

H-3: *The application of advanced technologies in agriculture enables sustainable agriculture and healthy food.*

H-4: *The level of application and adoption of advanced technologies in the Republic of Serbia is still at a low level.*

Agricultural production, since it is carried out on large areas, is an environmental problem, to which more and more attention is being paid. The European Union has defined in *Agenda 2000* that an increasing share of subsidies will have a part dedicated to reducing the negative effects on the environment, and it now amounts to 10 percent. The Republic of Serbia is committed to achieving the purposes related to adaptation to the consequences of climate change. In other words, our country is working to build a society whose economy and development should become resistant to changed climatic conditions.

e. Research methods and techniques. In researching the topic of this paper, we will use basic analytical and synthetic methods of cognition and research, but the focus will be on analysis, induction, deduction, comparison, concretization and generalization. These basic methods will be used during the process of acquiring scientific knowledge, but not simultaneously or equally.

Taking into account the complexity of the studied research topic, in the research process we will use methods and techniques that are adequate for research on agricultural animal insurance in the Republic of Serbia and thus bring our country closer to the European Union.

The methodological approach to this research required the application of basic analytical methods, namely: methods of analysis, abstraction and deduction, as well as basic synthetic methods such as synthesis, concretization and generalization. The following general scientific methods were used: deductive and analytical deductive.

In order to test the hypothesis and verify the assumptions, a methodological research approach was used, which can be grouped into three basic scientific methods:

- The primary research was conducted using relevant professional domestic and foreign literature and based on data and documents in the field of sustainable agriculture. Using this research, data were collected directly by analysis of subunits in the relevant field;
- Secondary research is based on the results of primary research and complements the importance of research that collects data from various sources, such as statistical publications, the Internet, domestic and foreign literature. The information gathered in this way is very important in the initial phase of research, but in order to conduct quality research, it is necessary to conduct primary research that can only facilitate complex marketing decisions.

The research also used a method to analyze the content of texts related to agricultural and domestic animal insurance and all innovations and factors that encourage them.

The study also used a comparative method, and data collection was planned to identify equivalences, similarities, and differences in farm and farm animal insurance.

In accordance with the criterion of general importance, this paper deals with the public component of the phenomenon in a certain unit of time and space. Therefore, the research is individual, but the research is also empirical-theoretical and focused on testing the existing theoretical-empirical findings, which verifies the purpose of this research.

The descriptive method assumes that the descriptive research enabled the knowledge of the characteristics, and the statistical method of the test results enabled the introduction of trends and variations.
The causal method determines the degree of connection of the investigated phenomena.

Tertiary research was conducted by a survey method on an appropriate sample of residents in Vojvodina (Novi Sad, Subotica, Sombor, Senta, Vrbas, Zrenjanin, Pančevo).

The research was performed by the method of theoretical analysis and the method of empirical alleged research. Empirical research was realized in three phases:
1. Collection of data from respondents by written examination technique;
2. Organizing and collecting data and
3. Data processing.

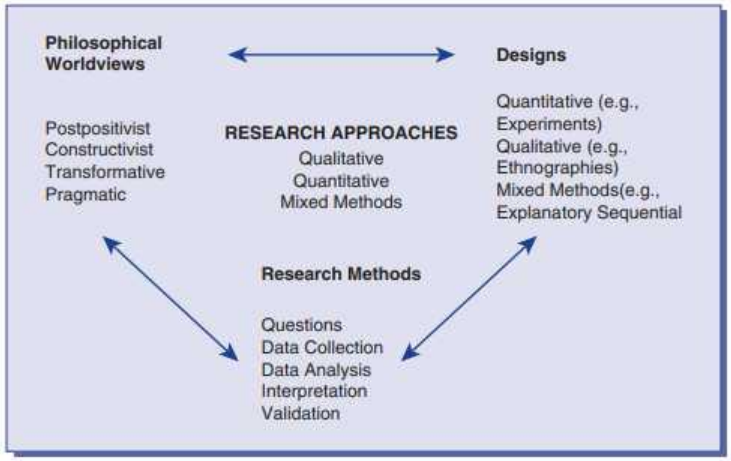


Figure 17. Research framework - linking layout, design and research methods
Source: Slife, B. D., Williams, R. N.: What's behind the research? Discovering hidden assumptions in the behavioral sciences. Thousand Oaks, CA: Sage Publications, 1995

A questionnaire with pre-prepared questions was used to collect data. The survey was anonymous, and the results are presented in tables and graphs.
Statistical data on sustainable agriculture in the Republic of Serbia, taken from the website of the Republic Statistical Office and the website of the National Bank of Serbia, were also used.

f. Scientific and social validity of research. The scientific validity of research stems from the importance of the problem and the subject of research. The theoretical determination of the subject of research significantly contributes to the construction of the theoretical definition of ecology and sustainable development. For the development of science, it is important to determine the level of application of advanced technologies in agriculture in the Republic of Serbia.

The scientific problem of the research is, first of all, to investigate and analyze the relevant issues of the impact of global environmental problems and advanced technologies on the sustainability of agricultural production, in order to answer the question of how to minimize the impact of global environmental problems and maximize apply advanced technologies, all with the aim of better functioning of sustainable agriculture. In addition, the idea is to analyze the impact of global environmental problems and advanced technologies, which has a real-time application character, on the basis of a scientifically based methodology, by collecting data.
The social validity of the research is reflected in the current and potential contribution to the objective understanding and treatment of ecology, sustainable development and advanced technologies. Starting from the topicality of this topic, but also from the fact that it has not been dealt with much in our literature (or the results of the research have not been published so far), it is clear that it has a broader social justification. The results of the research that will be conducted indicate the importance of the application of advanced technologies in agriculture and lead to better positioning and increase of agricultural production, which will reduce costs for both local governments and the state.

It is a topic that rightly attracts a lot of attention, since it refers to an important social problem. It will be presented to the public [2] the principle of developing environmental awareness as a universal European value. The importance of the use of renewable energy sources will also be pointed out, with special reference to the importance of the use and production of biomass.

Climate change at the global level has been manifested by a number of problems (very variable and extreme meteorological phenomena have occurred), and one of them is the change of conditions in agroecosystems. Agroecosystems have responded differently to these biophysical changes, both locally and globally.

Excessive chemicalization of agriculture has led to the accumulation of harmful residues in the land, their further migration into underground watercourses, but also the pollution of river watercourses and other surface waters.

The development of technology (especially ICT) has enabled new solutions in the field of agriculture. The application of ICT enables monitoring and documentation of production, and with the help of an appropriate GIS (Geographic Information System) data processing and workflow management. Precision Agriculture (PA) was defined in the first half of the twentieth century, and it consists in applying inputs in accordance with the needs, ie identified resources and anti-resources. Precision agricultural production is entering the application phase in many areas.

The paper will consider and define the concept of ecology and sustainable development. Also, the possibilities of application of advanced technologies in preserving and promoting sustainable development in agriculture will be pointed out.

RESULTS

A. VALIDATION OF HYPOTHESIS

The world's population is growing and more and more people are living in cities. As the number of people increases, so do the urban challenges. One of the biggest challenges is related to agricultural resources. The majority of the population is not aware of the importance of agriculture as a resource, except in extreme situations, such as floods, droughts and other agricultural disasters. In recent decades, it has been noticed that problems with agriculture can no longer be solved by hiring only experts in that field, nor only institutions in this field. Namely, the problems with agricultural production are increasingly related to other issues and sectors in the country, and require an integrated approach in the management of this important resource.

The main reasons and advantages of the development and application of new technologies in agriculture are:

- More efficient management of development and current agricultural policy,
- Creating conditions for continuous planning of agricultural production,
- Effective monitoring of the realization of plans,
- Effective decision-making on the directions of development and improvement of agriculture,
- Ability to analyze and report based on one or more criteria in relation to all relevant information,
- Monitoring of standardized and consumed quantities,
- Digitized plots and monitoring the execution of operations using GPS,
- Digitized plots and monitoring the execution of operations using GPS,
- Centralization of documentation..

The basic - general hypothesis that was used in this research is:

H-1: *The application of advanced technologies in the field of sustainable agriculture contributes to the optimization of investments, reduction of losses and maximization of income.*

In order to confirm or refute the general hypothesis and to make agricultural production as competitive as possible, examples were analyzed:

[2] It is understood that the scope of work significantly affects the scope of the methodological aspect of the research.

- Precision agriculture and irrigation,
- Precision agriculture and plant protection,
- Existing machinery and equipment and precision agriculture.

H-2: *The advantages of using advanced technologies in agriculture are undoubted.*

In agriculture, there is great pressure to reduce production costs and improve productivity, in order to reduce the cost price and make products competitive. A large part of agricultural producers in the Republic of Serbia are not able to meet the requirements in terms of quality standards, quantity and continuity of market supply. In order to achieve quality and price competitiveness of agricultural products, it is necessary to apply new knowledge, innovation and technological progress.

By saving input, it is possible to reduce costs, thus increasing profits. Precision agriculture, ie. precise plant nutrition achieves accurate determination of the composition of each part of the plot and recommendations for the improvement of those parts since not all plots are the same (eg on one plot certain parts have a problem or some parts provide higher yield, some mediocre, etc.).

The most important factors [3] which affect economic viability are:

- size and shape of arable land,
- type of agricultural production (farming, vegetables ...),
- number and type of applications during the year,
- type and organization of mechanization work,
- price of GPS guidance system,
- reduction of overlaps and / or lintels, and thus reduction of the quantity / price of input (material, fuel ...) by about 5-15%,
- increase in speed at work by about 15%,
- extension of the working day, ie. increasing labor productivity and agricultural machinery,
- ability to work at night and with reduced visibility, with the same accuracy as during the day (especially important for certain operations, eg spraying),
- less operator fatigue,
- in automatic control, the operator is focused on the operation of the implement.

The advantages of "smart" agriculture are:

- Save time,
- Saving money,
- Controlled production conditions,
- Reduction of the workforce.

The saving of money and time can be seen in the example of smaller fruit growers who do not live near the plot on which the production is performed.

Controlled production conditions are important for both producers because everyone wants quality produce and high profits.

The reduction in manpower is particularly pronounced in large orchards over 10 ha because the area to be controlled is large and, say, a mobile application can greatly facilitate the management of the orchard.

Table 7 shows savings per hectare, total savings per crop and total savings for all crops in the 2009/10 season.

[3] http://www.greensoft.co/rs/medija-centar/clanci/67/informacione-tehnologije-u-poljoprivredi/ (15.01.2020)

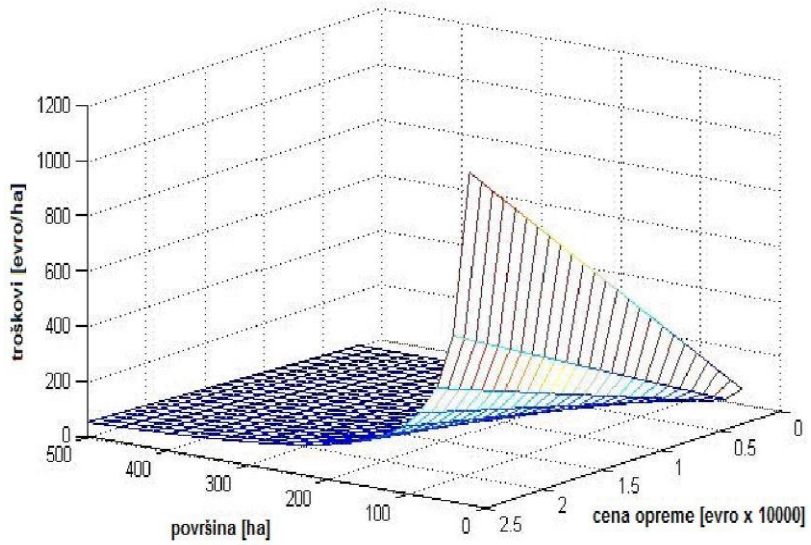
Table 6. Overview of savings per hectare, total savings per crop and total savings for all crops in the 2009/10 season

Crop	**Crop area**	**Savings per crop per hectare**	**Total crop savings**
Corn	6573	12,72 €	82.097 €
Wheat and barley	6049	26,37 €	159.512 €
Soy	2384	7,13 €	16.450 €
Sugar beet	1247	7,93 €	9.639 €
Alfalfa	2705	11,82 €	31.973 €
Total savings for all crops:			301.980 €

Source: Марковић, Д., Покрајац, С., Симоновић, В., Марковић, И.: EKONOMSKA EVALUACIJA GPS TEHNOLOGIJE U POLJOPRIVREDI SRBIJE, Škola biznisa, 3-4/2013, 1-11, стр. 8

The author Markovic and Sardanians state: "As a final result of the analysis of potential savings when using satellite positioning on PKB properties, and when automatically controlling tractors and other machines, the amount of 301,980 euros per season was obtained." Average savings per hectare in the structure of sowing in the 2009/10 season. was 15.92 € / ha. This is a direct saving in inputs and fuel. We should also keep in mind the increase in productivity, the possibility of savings due to possible night work using satellite positioning, the possibility of achieving the concept of precision agricultural production through management, bookkeeping, various documentation and production planning in the future, improving working conditions for machine operators, and, finally, the possibility of contributing to environmental protection within the city's "green ring".

In Figure 33, the authors show the formation of costs per unit area (1ha), depending on the size of the area on which the navigation devices are applied, and state: “A navigation device or a complete system used for navigation and control of a tractor is cost-effective the area on which the costs are less than the projected potential savings. With the growth of the area, which is processed using satellite guidance, the unit costs of the device decrease. At the same time, one should keep in mind how many hectares one tractor can cultivate during the year.”[4]



[4] Марковић, Д., Покрајац, С., Симоновић, В., Марковић, И.: опет. цит., стр. 9

Figure 33. Device costs expressed per unit area, depending on the size of the area on which the guidance system is applied

Source: Марковић, Д., Покрајац, С., Симоновић, В., Марковић, И.: ЕКОНОМСКА ЕВАЛУАЦИЈА ГПС ТЕХНОЛОГИЈЕ У ПОЉОПРИВРЕДИ СРБИЈЕ, Школа бизниса, 3-4/2013, 1-11, стр. 9.

H-3: *The application of advanced technologies in agriculture to sustainable agriculture and healthy food.*
This particular hypothesis has been confirmed.

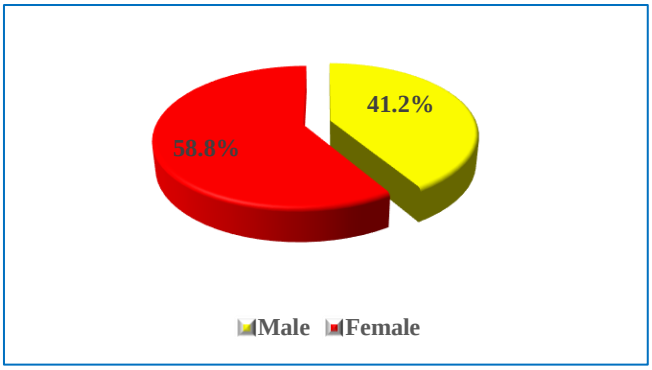
B. RESULTS OF A SURVEY

The development of agriculture and food security in the world have become a general concern of the international community. Economic growth is complex, but sustainable growth is even more complex. Economic growth, as a process of "creative destruction", as it is now, is not compatible with the environment. With the right choice of technology we can achieve constant economic growth while respecting nature. In order for growth to be in line with the environment, the world economy must develop differently in the future. The world economy has become extremely large in relation to the available resources. Humanity is approaching the constraints of the environment. Certain scientific and professional knowledge indicates an increasing number of people in the world, climate change resulting from increased levels of greenhouse gases, ocean pollution, ozone depletion, pollution due to excessive use of nitrogen and phosphorus, in the form of fertilizers used by agriculture, excessive use and depletion of the most important sources of fresh water, chemical pollution.
New technologies are important for the development of modern agriculture in new conditions, as well as climatic conditions. Climate has a strong impact on crop productivity, as well as on scarcity or availability of water resources.

Sustainable agriculture is based on the use of technologies that maximize productivity and at the same time minimize the negative effects on natural (land, water and biodiversity) and human resources (rural population and consumers). In order to make the most efficient use of resources, sustainable agriculture embraces social cohesion.

The priority of EU agriculture is Sustainable agricultural and rural development, which means "managing and preserving natural resources and directing technological and institutional changes so as to ensure that the needs of present and future generations are met and continuously met." This is in line with the EU 2020 Strategy for smart, sustainable and inclusive growth, which means "smart, sustainable and inclusive economic growth".
The sustainable development model includes behavior change, public awareness, value systems, political and individual responsibility, and the introduction of new systems and technologies, which can reduce environmental pressures and contribute to making the economy and lifestyle more resilient to environmental change. Sustainable agricultural production and the supply of safe food in the world are becoming a priority. Namely, the simplification of agricultural methods and the application of cheap externally produced funds is a more efficient way to reduce production costs than the introduction of advanced technologies.

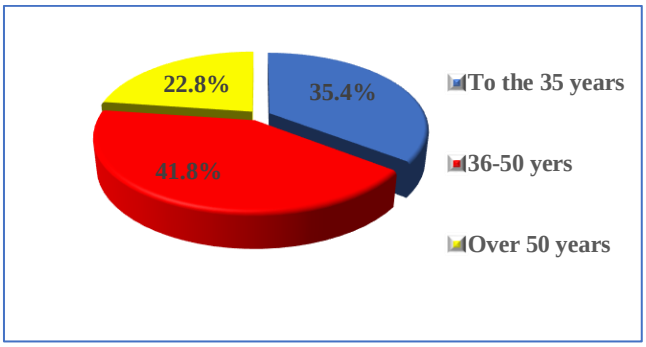
The purpose of this research is to seek answers to the question of what citizens think about the application of advanced technologies in the function of sustainable agricultural development. Do they think that advanced technologies are needed for sustainable agricultural development?
The research was done on the territory of Vojvodina, on a suitable sample of 325 respondents. The following is an analysis of the sample by gender, age, education, work experience and cities.



Graph 1. Sample structure by gender

Source: Author

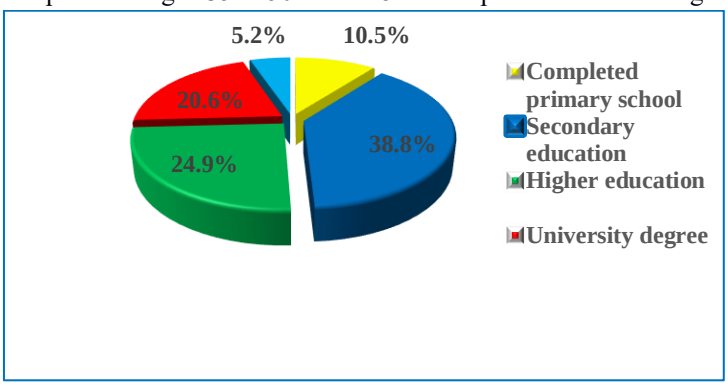
Graph 1. shows the structure of respondents in relation to gender. As we can see in the sample, 58.8% of women and 41.2% of men are represented.



Graph 2. Structure of the sample by age

Source: Author

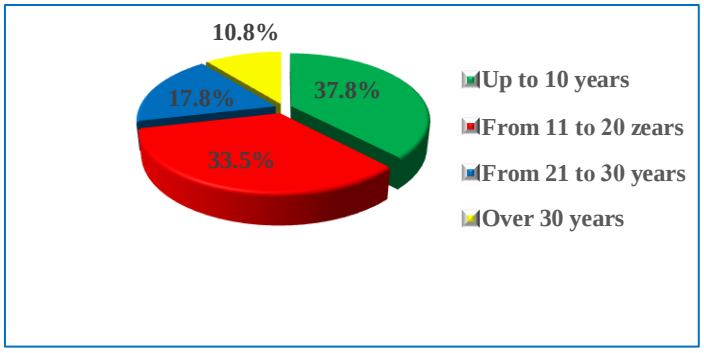
Graph 2. shows the structure of respondents by age. As we can see in the sample, 35.4% of respondents under the age of 35, 41.8% of respondents aged 35 to 50 and 22.8% of respondents over the age of 50 are represented.



Graph 3. Structure of the sample according to qualifications

Source: Author

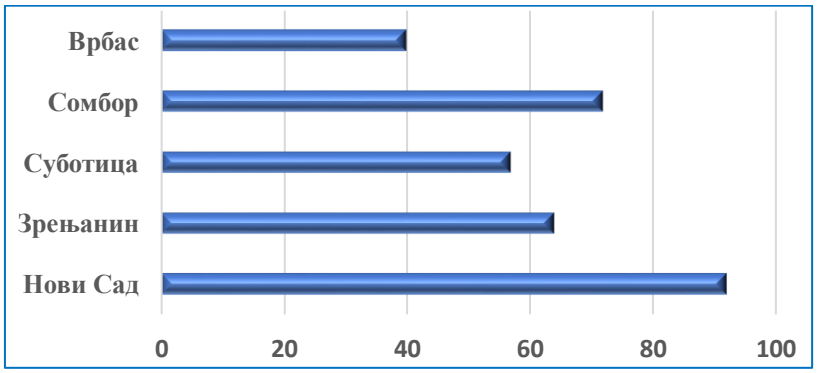
Graph 3. shows the structure of respondents by education. As we can see in the sample, 10.5% of respondents with completed primary school, 38.8% of respondents with secondary education, 24.9% of respondents with higher education, 20.6% of respondents with higher education and 5.2 % master / doctor of science.



Graph 4. Structure of the sample by work experience

Source: Author

Graph 4. shows the structure of respondents by work experience. As we can see in the sample, 37.8% of respondents up to 10 years of work experience, 33.5% of respondents from 11 to 20 years of work experience, 17.8% of respondents from 21 to 30 years of work experience, 10.8% of respondents over 30 years of work experience.



Graph 5. Sample structure by cities

Source: Author

Graph 5. shows the structure of respondents by cities. There are 92 respondents from Novi Sad, 64 respondents from Zrenjanin, 57 respondents from Subotica, 72 respondents from Sombor, and 40 respondents from Vrbas, a total of 325 respondents.

B. 1. Non-parametric statistical procedure for assessing the attitude of the population towards the applicability of advanced technologies in the function of sustainable agricultural development

In this section, we will use the nonparametric statistical procedure $\chi 2$ test and the contingency coefficient C for data processing. Nonparametric statistical procedures examine the statistical significance of statistical indicators that are applied regardless of whether the data are measured or counted and distributed normally or distributed differently. In other words, it does not depend on the shape of the frequency distribution. The $\chi 2$ test is a nonparametric statistical procedure. This means that qualitative (categorical) data are used in its calculation. It should be emphasized that units other than frequency are not considered for data processing using the $\chi 2$ test.

By measuring the value of the $\chi 2$ test and the coefficient of coherence C, we will determine the relationships between the attitudes of the respondents and their socio-andragogical characteristics: gender, age, education, and work experience. The aim of this non-parametric procedure is to examine whether independent variables influence the attitude of respondents on certain issues. We will determine whether there is a statistical connection between the socio-andragogical characteristics of the respondents and attitudes on certain issues.

Respondents' attitude on the issue: The application of advanced technologies in the function of sustainable agricultural development is a good choice

Advanced technologies are increasingly used in all spheres of human life, so it is certain that agricultural production is not immune to it. The reasons for this are numerous. It is interesting to see how the citizens of the Republic of Serbia view this problem. This is shown by the data in the following tables.

Table 7. provides data on the attitude of respondents on whether the application of advanced technologies in the function of sustainable agricultural development is the right choice.

Here, the prevailing opinion among the respondents is that advanced technologies are the right choice. Collectively, the majority of respondents 55.4% have a positive attitude, 20.9% are undecided and 23.7% have a negative attitude. It is evident that not all independent variables are significantly related to the given attitudes. Namely, the value of $\chi 2$ test and contingency coefficient C show that gender ($\chi 2 = 1.309$, $C = 0.063$ and $p = 0.890$), education ($\chi 2 = 10.270$, $C = 0.175$ and $p = 0.852$), work experience ($\chi 2 = 19.904$, $C = 0.240$ and $p = 0.069$), are not statistically significantly related to the stated attitude of the respondents (attitude: The application of advanced technologies in the function of sustainable agricultural development is a good choice). This means that we do not have significant deviations regarding the mentioned position.

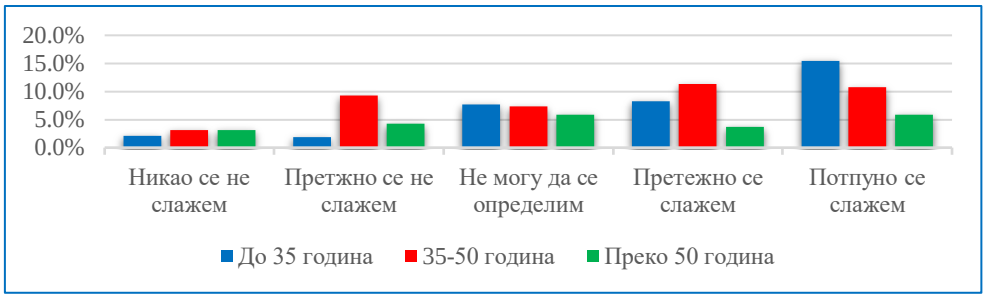
Table 7. The application of advanced technologies in the function of sustainable agricultural development is the right choice

Socio-andragogical characteristics of the respondents		The application of advanced technologies in the function of sustainable agricultural development is the right choice								
		1	2	3	4	5	In total		x^2 i C	p
Gender	1. Male	11	23	30	31	39	134	325 100%	x^2=1,309 C=0,063	p=0,890 p>0,05
		3,4%	7,1%	9,2%	9,5%	12,0%	41,2%			
	2. Female	16	27	38	45	65	191			
		4,9%	8,3%	11,7%	13,8%	20,0%	58,8%			
Years of life	1. Up to 35 years	7	6	25	27	50	115	325 100%	x^2=26,848 C=0,276	p=0,001 p<0,05
		2,2%	1,8%	7,7%	8,3%	15,4%	35,4%			
	2. 36-50 years	10	30	24	37	35	136			
		3,1%	9,2%	7,4%	11,4%	10,8%	41,8%			
	3. Over 50 years	10	14	19	12	19	74			
		3,1%	4,3%	5,8%	3,7%	5,8%	22,8%			
Education	1. Completed primary school	6	6	6	6	10	34	325 100%	x^2=10,270 C=0,175	p=0,852 p>0,05
		1,8%	1,8%	1,8%	1,8%	3,1%	10,5%			
	2. Sec. professi. Accord.	8	17	29	29	43	126			
		2,5%	5,2%	8,9%	8,9%	13,2%	38,8%			
	3. Higher education	7	10	18	20	26	81			
		2,2%	3,1%	5,5%	6,2%	8,0%	24,9%			
	4. Higher	4	15	11	17	20	67			
		1,2%	4,6%	3,4%	5,2%	6,2%	20,6%			

	education									
	5. MA / PhD Science	2	2	4	4	5	17			
		0,6%	0,6%	1,2%	1,2%	1,5%	5,2%			
Work experience	1. Up to 10 years	7	15	25	28	48	123	325 100%	x^2=19,904 C=0,240	p=0,069 p>0,05
		2,2%	4,6%	7,7%	8,6%	14,8%	37,8%			
	2. From 11 to 20 years	12	18	18	34	27	109			
		3,7%	5,5%	5,5%	10,5%	8,3%	33,5%			
	3. From 21 to 30 years	3	13	14	9	19	58			
		0,9%	4,0%	4,3%	2,8%	5,8%	17,8%			
	4. Over 30 years	5	4	11	5	10	35			
		1,5%	1,2%	3,4%	1,5%	3,1%	10,8%			

Source: Author

On the other hand, the years of life ($\chi 2 = 26.848$, $C = 0.276$ and $p = 0.001$) are statistically significantly related to the mentioned attitude. In other words, it means that the answers of the respondents are statistically significantly different with regard to the age.



Graph 7. The application of advanced technologies in the function of sustainable agricultural development is the right choice - the age. Source: Author

If we look at these results in Graph 7. the generation under 35 and the generation from 36 to 50 attach significantly more importance to the view that the application of advanced technologies in the function of sustainable agricultural development is the right choice. Generation under 35 23.7% agree that the application of advanced technologies in the function of sustainable agricultural development is a good choice, 7.7% are undecided and 4.0% disagree with the mentioned position. The generation from 36 to 50 years 22.2% agree with the mentioned attitude, 7.4% are undecided and 12.3% do not agree with the mentioned attitude. Generation over 50 9.5% agree with the attitude, 5.8% are undecided and 7.4% disagree with the mentioned attitude. Generations up to the age of 50 have much more confidence in the application of advanced technologies in the function of sustainable agricultural development. Which indicates that it is a necessity of the modern age, the younger generations more easily accept advanced technologies. Of course, in order for this to fully come to life, all activities on this issue must be supported by the state. It is certain that the respondents cannot solve this issue on their own, and the maximum involvement of all state apparatuses is expected in resolving this issue. This attitude of the young and middle generation may be expected. They accept new technologies much easier.

Respondents' attitude towards the issue: I expect that the application of advanced technologies in the function of sustainable agricultural development will give good results

The following table shows the results of research on the application of advanced technologies in the function of sustainable agricultural development. Table 8. gives data on the attitude of the respondents.
From the data we see that 61.8% of respondents agree with the mentioned attitude, 17.8% are undecided and 20.3% have a negative attitude. Here, too, not all independent variables are significantly related to the attitudes of the application of advanced technologies in the function of sustainable agricultural development. The value of $\chi 2$ test and contingency coefficient C show that only sex ($\chi 2$ = 6,554, C = 0,141 and p = 0,161) is not statistically significantly related to the stated attitude of the respondents (attitude: I expect that the application of advanced technologies in the function of sustainable agricultural development will give good results). This means that we do not have significant deviations regarding the mentioned position.

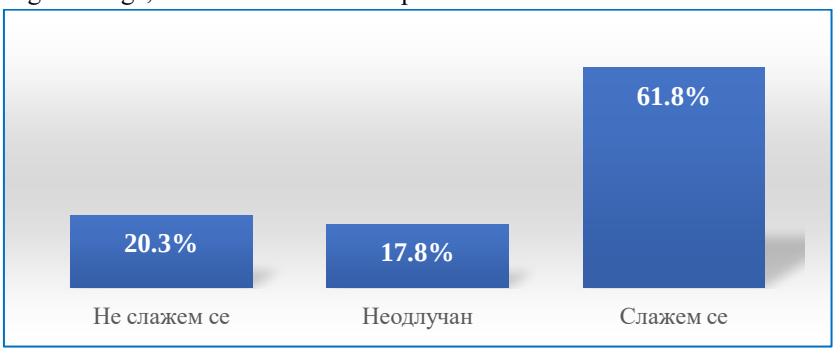
Table 8. I expect that the application of advanced technologies in the function of sustainable agricultural development will give good results

Socio-andragogical characteristics of the respondents		I expect that the application of advanced technologies in the function of sustainable agricultural development will give good results								
		1	2	3	4	5	In total		x^2 i C	p
Gender	1. Male	17	11	25	38	43	134	325 100%	x^2=6,554 C=0,141	p=0,161 p>0,05
		5,2%	3,4%	7,7%	11,7%	13,2%	41,2%			
	2. Female	13	25	33	45	75	191			
		4,0%	7,7%	10,2%	13,8%	23,1%	58,8%			
Years of life	1. Up to 35 years	9	10	20	25	51	115	325 100%	x^2=24,350 C=0,264	p=0,002 p<0,05
		2,8%	3,1%	6,2%	7,7%	15,7%	35,4%			
	2. 36-50 years	9	13	19	46	49	136			
		2,8%	4,0%	5,8%	14,2%	15,1%	41,8%			
	3. Over 50 years	12	13	19	12	18	74			
		3,7%	4,0%	5,8%	3,7%	5,5%	22,8%			
Education	1. Completed primary school	7	9	5	4	9	34	325 100%	x^2=27,227 C=0,278	p=0,039 p<0,05
		2,2%	2,8%	1,5%	1,2%	2,8%	10,5%			
	2. Sec. professi. Accord.	13	14	22	29	48	126			
		4,0%	4,3%	6,8%	8,9%	14,8%	38,8%			
	3. Higher education	5	8	14	26	28	81			
		1,5%	2,5%	4,3%	8,0%	8,6%	24,9%			
	4. Higher education	5	5	13	21	23	67			
		1,5%	1,5%	4,0%	6,5%	7,1%	20,6%			
	5. MA / PhD Science	0	0	4	3	10	17			
		0,0%	0,0%	1,2%	0,9%	3,1%	5,2%			
Work experience	1. Up to 10 years	9	9	18	28	59	123	325 100%	x^2=21,516 C=0,249	p=0,043 p<0,05
		2,8%	2,8%	5,5%	8,6%	18,2%	37,8%			
	2. From 11 to 20 years	11	16	19	30	33	109			
		3,4%	4,9%	5,8%	9,2%	10,2%	33,5%			
	3. From 21 to 30 years	3	9	12	17	17	58			
		0,9%	2,8%	3,7%	5,2%	5,2%	17,8%			
		7	2	9	8	9	35			

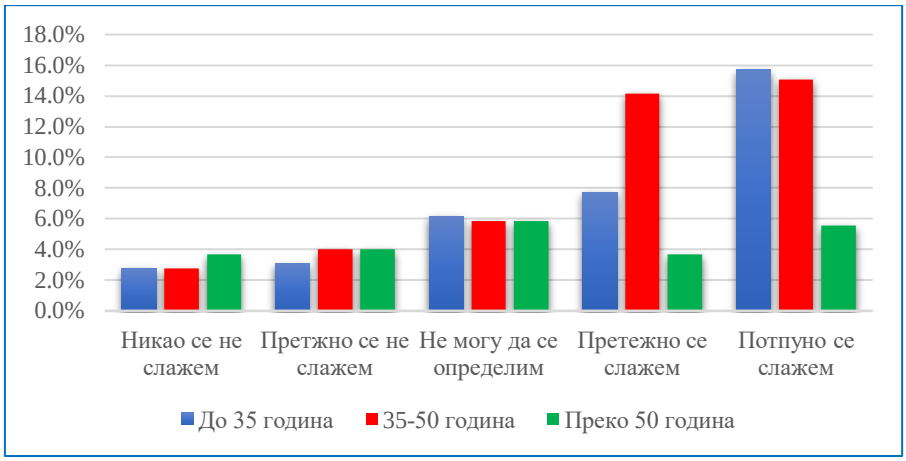
	4. Over 30 years	2,2%	0,6%	2,8%	2,5%	2,8%	10,8%			

Source: Author

Independent variables of age ($\chi 2 = 24{,}350$, $C = 0.264$ and $p = 0.002$), education ($\chi 2 = 27.227$, $C = 0.278$ and $p = 0.039$) and work experience ($\chi 2 = 21.516$, $C = 0.249$ and $p = 0.043$) are statistically significantly related to the mentioned attitude. In other words, it means that the answers of the respondents differ statistically significantly with regard to age, education and work experience.

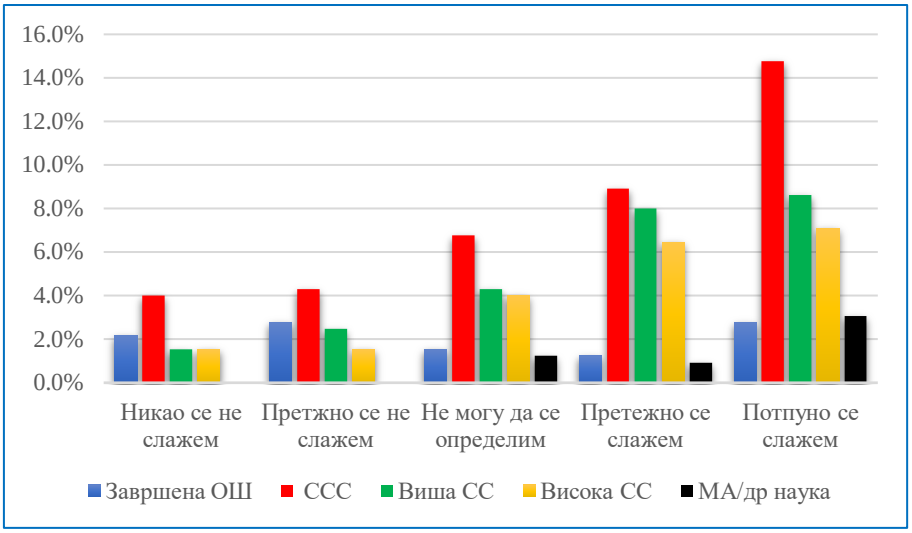


Graph 8. I expect that the application of advanced technologies in the function of sustainable agricultural development will give good results - total percentages. Source: Author



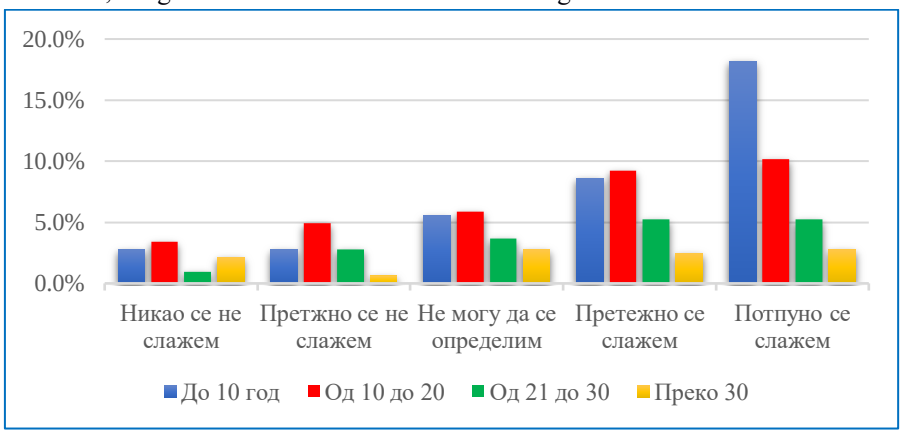
Graph 9. I expect that the application of advanced technologies in the function of sustainable development of agriculture will give good results - years of life. Source: Author

By analyzing the data in Graph 9. we see that the attitudes of the generation from 36 to 50 and the generation up to 35 differ significantly from the attitudes of the generation over 50. Generation up to 35 years 23.4% of respondents agree that the application of advanced technologies in the function of sustainable agricultural development will give good results, 6.2% of respondents are undecided and 5.9% do not agree with the mentioned attitude. Generation from 36 to 50 years 29.3% of respondents agree with the mentioned attitude, 5.8% are undecided and 6.8% do not agree with the mentioned attitude. Generation over 50 years 9.2% agree with the mentioned attitude, 5.8% are undecided and 7.7% of respondents do not agree with the mentioned attitude.



Graph 10. I expect that the application of advanced technologies in the function of sustainable development of agriculture will give good results – education. Source: Author

By analyzing the data in Graph 10. we see that the attitude towards the application of advanced technologies in the function of sustainable agricultural development also depends on the professional qualifications of the respondents. Among respondents with completed primary school, 4.0% agree with the mentioned attitude, 1.5% are undecided and 5.0% do not agree with the mentioned attitude. The situation is somewhat different among respondents with secondary education, 23.7% agree with the mentioned attitude, 6.8% are undecided and 8.3% do not agree with the mentioned attitude. Also, 16.6% of respondents with a university degree agree with the mentioned attitude, 4.3% are undecided and 4.0% do not agree with the mentioned attitude. With a high SS, 13.6% of respondents agree with the mentioned attitude, 4.0% are undecided and 3.0% of respondents disagree with the mentioned attitude. In the case of MSc, 4.0% of respondents agree with the mentioned position, 1.2% are undecided and we do not have respondents who do not agree with the mentioned position. We can conclude that the higher the education, the greater the trust in advanced technologies.



Graph 11. I expect that the application of advanced technologies in the function of sustainable development of agriculture will give good results - work experience. Source: Author

By analyzing the data in Graph 11. we see that the attitude towards the application of advanced technologies in the function of sustainable agricultural development also depends on the work experience of the respondents. Among respondents with work experience up to 10 years, 24.8% of respondents agree with the mentioned attitude, 5.5% are indecisive and 5.6% do not agree with the mentioned attitude. Among respondents with work experience from 11 to 20 years, 19.4% agree with the mentioned attitude, 5.8% are undecided and 8.3% do not agree with the mentioned attitude. The situation with respondents with work experience from 21 to 30 years is as follows, 10.4% agree with the mentioned attitude, 3.7% are undecided and 3.7% do not agree with the

mentioned attitude. Among respondents with work experience over 30 years, 5.3% agree with the mentioned attitude, 2.8% are undecided and 2.8% do not agree with the mentioned attitude. These are perhaps the expected results due to the fact that the younger generations who are in favor of advanced technologies also have less work experience due to the number of years

Respondents' attitude towards the question: The application of advanced technologies in the function of sustainable agricultural development guarantees quality agricultural production

Scientists are increasingly warning that agricultural land will become barren due to the destruction of humus. If nothing is done, there is a danger that the Earth will become a barren planet - unfit for life. That is why the protection of the environment and sustainable action is not only a current, but also an urgent problem, which must be solved very quickly and efficiently.

The new era of agriculture requires new, sustainable solutions and technologies, in order to enable producers to produce more, with less investment. Producers, through crop protection with superior seed, genetic seed traits and digital farming tools, are provided with more comprehensive solutions to overcome the obstacles that await them in the future. Sustainable agriculture is becoming crucial in providing enough food for the world's growing population. Sustainable agriculture has the potential to improve both food stocks and protect the environment.

The advantages of using advanced technologies in agriculture are undoubted, but the level of adoption and application of these technologies in our country is still at a very low level. While the application of advanced technologies in agriculture has come a long way in the world, in our country it is still in its infancy. In order to achieve that, greater engagement of experts in this field is needed, as well as more mass education of agricultural engineers. The farmer must be trained to apply advanced technologies efficiently.

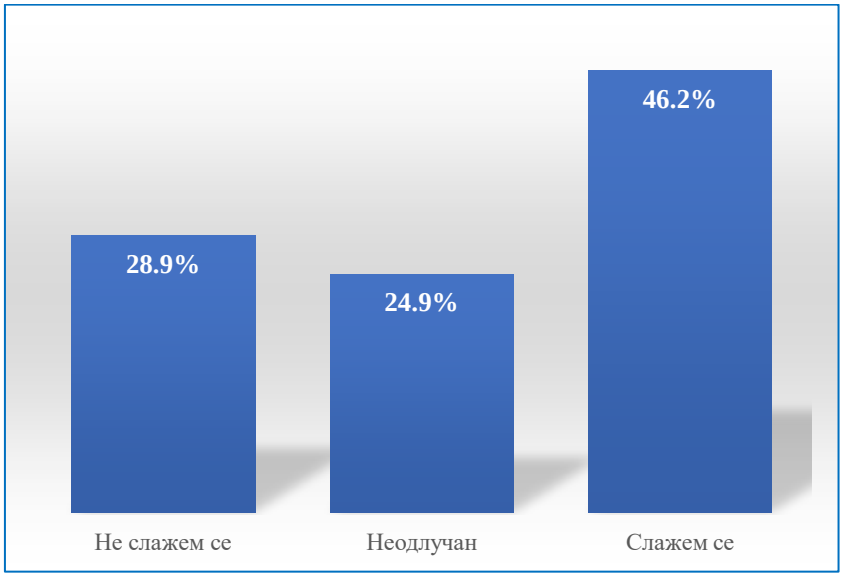
It is very important what the citizens of the Republic of Serbia think, whether the application of advanced technologies in the function of sustainable agricultural development guarantees quality agricultural production.

Table 9. The application of advanced technologies in the function of sustainable agricultural development guarantees quality agricultural production

Socio-andragogical characteristics of the respondents		The application of advanced technologies in the function of sustainable agricultural development guarantees quality agricultural production								
		1	2	3	4	5	In total		x^2 i C	p
Gender	1. Male	20	21	30	31	32	134	325 100%	x^2=3,345 C=0,101	p=0,502 p>0,05
		6,2%	6,5%	9,2%	9,5%	9,8%	41,2%			
	2. Female	25	28	51	54	33	191			
		7,7%	8,6%	15,7%	16,6%	10,2%	58,8%			
Years of life	1. Up to 35 years	12	10	36	34	23	115	325 100%	x^2=15,520 C=0,213	p=0,050 p<0,05
		3,7%	3,1%	11,1%	10,5%	7,1%	35,4%			
	2. 36-50 years	17	24	28	38	29	136			
		5,2%	7,4%	8,6%	11,7%	8,9%	41,8%			
	3. Over 50 years	16	15	17	13	13	74			
		4,9%	4,6%	5,2%	4,0%	4,0%	22,8%			
Education	1. Completed primary school	9	8	8	5	4	34	325 100%	x^2=20,231 C=0,242	p=0,210 p>0,05
		2,8%	2,5%	2,5%	1,5%	1,2%	10,5%			
	2. Sec. professi. Accord.	15	15	33	34	29	126			
		4,6%	4,6%	10,2%	10,5%	8,9%	38,8%			
	3. Higher education	13	14	22	17	15	81			
		4,0%	4,3%	6,8%	5,2%	4,6%	24,9%			

	4. Higher education	6	10	16	20	15	67			
		1,8%	3,1%	4,9%	6,2%	4,6%	20,6%			
	5. MA / PhD Science	2	2	2	9	2	17			
		0,6%	0,6%	0,6%	2,8%	0,6%	5,2%			
Work experience	1. Up to 10 years	17	9	36	37	24	123	325 100%	x^2=15,006 C=0,210	
		5,2%	2,8%	11,1%	11,4%	7,4%	37,8%			
	2. From 11 to 20 years	15	24	20	29	21	109			
		4,6%	7,4%	6,2%	8,9%	6,5%	33,5%			
	3. From 21 to 30 years	9	9	14	13	13	58			
		2,8%	2,8%	4,3%	4,0%	4,0%	17,8%			
	4. Over 30 years	4	7	11	6	7	35			
		1,2%	2,2%	3,4%	1,8%	2,2%	10,8%			

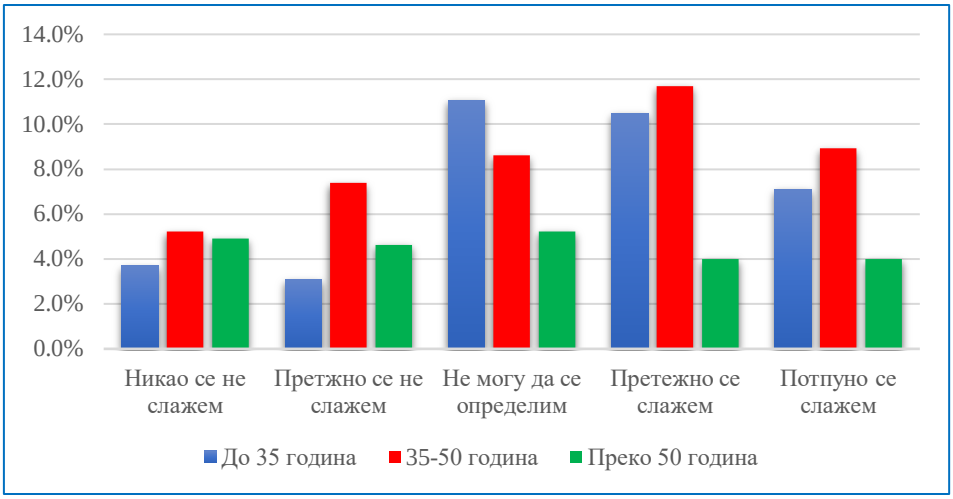
Source: Author



Graph 12. Application of advanced technologies in the function of sustainable development of agriculture guarantees quality agricultural production - total percentages. Source: Author

Data on the attitude of respondents whether the application of advanced technologies in the function of sustainable agricultural development guarantees quality agricultural production are shown in Table 9. Similar to the previous question, most respondents agree with the mentioned attitude. Collectively, 28.9% of respondents have a negative attitude, 24.9% of respondents are undecided and 46.2% have a positive attitude. Here, too, all independent variables are not significantly related to the attitude of respondents on the application of advanced technologies in the function of sustainable agricultural development, the value of $\chi 2$ test and contingency coefficient C show that gender ($\chi 2 = 3,345$, $C = 0,101$ and $p = 0,502$), education ($\chi 2 = 20,231$, $C = 0,242$ and $p = 0,210$) and work experience ($\chi 2 = 15,006$, $C = 0,210$ and $p = 0,241$) are not statistically significantly related to the stated attitude of the respondents (attitude: Application of advanced technologies in the function of sustainable agricultural development guarantees quality production). This means that we do not have significant deviations regarding the mentioned position.

The independent variable of age ($\chi 2 = 15,520$, $C = 0.213$ and $p = 0.050$) was statistically significantly associated with the mentioned attitude. In other words, it means that the answers of the respondents are statistically significantly different with regard to the age of the respondents.



Graph 13. Application of advanced technologies in the function of sustainable development of agriculture guarantees quality agricultural production - years of life. Source: Author

By analyzing the data in Graph 13. we see that depending on the age, the attitude of the respondents significantly depends on the application of advanced technologies in the function of sustainable agricultural development, which guarantees quality agricultural production. Among respondents under the age of 35, 17.6% agree with the mentioned attitude, 11.1% are undecided and 4.8% of respondents do not trust. Among respondents aged 36 to 50, 20.6% agree with the mentioned attitude, 8.6% are indecisive and 12.6% do not agree with the mentioned attitude. When it comes to respondents over 50, 8.0% agree with the mentioned attitude, 5.2% are undecided and 9.5% disagree with the mentioned attitude.

Respondents' attitude towards the question: The application of advanced technologies in the function of sustainable agricultural development can be successfully realized

All previous indicators and analyzes indicate that the application of advanced technologies in the function of sustainable agricultural development gives good results. The following table shows the results of the opinion of the citizens of the Republic of Serbia on whether the application of advanced technologies can be realized successfully.

Table 10. provides data on the attitudes of the respondents as to whether the application of advanced technologies in the function of sustainable development of agricultural production can be successfully realized.

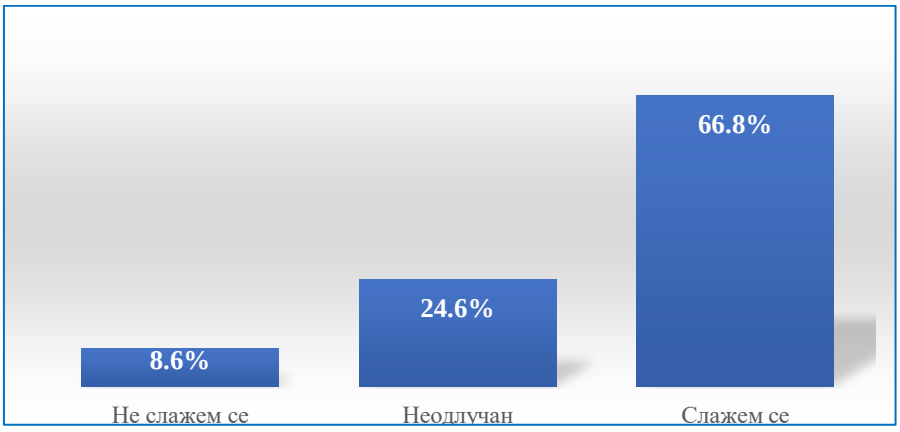
Table 10. The application of advanced technologies in the function of sustainable agricultural development can be successfully realized

Socio-andragogical characteristics of the respondents		The application of advanced technologies in the function of sustainable agricultural development can be successfully realized								
		1	2	3	4	5	In total		x^2 i C	p
Gender	1. Male	7	5	37	39	46	134	325 100%	x^2=2,079 C=0,080	p=0,721 p>0,05
		2,2%	1,5%	11,4%	12,0%	14,2%	41,2%			
	2. Female	7	9	43	56	76	191			
		2,2%	2,8%	13,2%	17,2%	23,4%	58,8%			
Years of life	1. Up to 35 years	5	4	33	33	40	115	325 100%	x^2=3,773 C=0,107	p=0,877 p>0,05
		1,5%	1,2%	10,2%	10,2%	12,3%	35,4%			
	2. 36-50 years	5	5	32	42	52	136			
		1,5%	1,5%	9,8%	12,9%	16,0%	41,8%			
	3. Over 50 years	4	5	15	20	30	74			
		1,2%	1,5%	4,6%	6,2%	9,2%	22,8%			

Education	1. Completed primary school	2	1	4	14	13	34	325 100%	x^2=14,753 C=0,208	p=0,543 p>0,05
		0,6%	0,3%	1,2%	4,3%	4,0%	10,5%			
	2. Sec. professi. Accord.	5	6	30	30	55	126			
		1,5%	1,8%	9,2%	9,2%	16,9%	38,8%			
	3. Higher education	6	3	21	28	23	81			
		1,8%	0,9%	6,5%	8,6%	7,1%	24,9%			
	4. Higher education	1	3	20	19	24	67			
		0,3%	0,9%	6,2%	5,8%	7,4%	20,6%			
	5. MA / PhD Science	0	1	5	4	7	17			
		0,0%	0,3%	1,5%	1,2%	2,2%	5,2%			
Work experience	1. Up to 10 years	6	5	33	36	43	123	325 100%	x^2=2,417 C=0,086	p=0,998 p>0,05
		1,8%	1,5%	10,2%	11,1%	13,2%	37,8%			
	2. From 11 to 20 years	4	4	26	31	44	109			
		1,2%	1,2%	8,0%	9,5%	13,5%	33,5%			
	3. From 21 to 30 years	2	3	14	16	23	58			
		0,6%	0,9%	4,3%	4,9%	7,1%	17,8%			
	4. Over 30 years	2	2	7	12	12	35			
		0,6%	0,6%	2,2%	3,7%	3,7%	10,8%			

Source: Author

As can be seen from the data, the prevailing opinion here is that the application of advanced technologies can be successfully realized. The majority of respondents agree with the mentioned attitude of 66.8%, 24.6% are undecided and 8.6% do not agree with the mentioned attitude. In this case, not all independent variables are significantly related to the mentioned attitude, the value of χ2 test and contingency coefficient C show that sex (χ2 = 2,079, C = 0,080 and p = 0,721), age (χ2 = 3,773, C = 0,107 and p = 0.877), education (χ2 = 14.753, C = 0.208 and p = 0.543) and work experience (χ2 = 2.417, C = 0.086 and p = 0.998) are not statistically significantly related to the stated attitude of the respondents (attitude: Application of advanced technologies in function sustainable development of agriculture can be successfully realized). This means that we do not have significant deviations regarding the mentioned position. Regardless of gender, age, education and work experience, all respondents mostly agree with the mentioned attitude.



Graph 14. Application of advanced technologies in the function of sustainable development of agriculture can be successfully realized - total percentages. Source: Author

Respondents' attitude towards the question: The application of advanced technologies in the function of sustainable agricultural development in our country is not sufficiently developed

Table 11. The application of advanced technologies in the function of sustainable development of agriculture in our country is not sufficiently developed

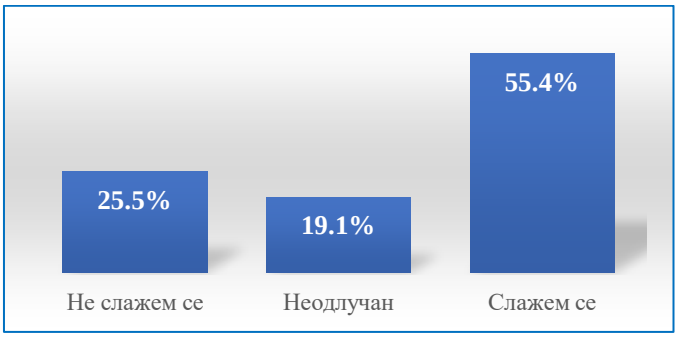
Socio-andragogical characteristics of the respondents		The application of advanced technologies in the function of sustainable development of agriculture in our country is not sufficiently developed								
		1	2	3	4	5	In total		x^2 i C	p
Gender	1. Male	12	22	27	38	35	134	325 100%	x^2=1,740 C=0,073	p=0,783 p>0,05
		3,7%	6,8%	8,3%	11,7%	10,8%	41,2%			
	2. Female	12	37	35	61	46	191			
		3,7%	11,4%	10,8%	18,8%	14,2%	58,8%			
Years of life	1. Up to 35 years	12	16	17	43	27	115	325 100%	x^2=16,293 C=0,218	p=0,038 p<0,05
		3,7%	4,9%	5,2%	13,2%	8,3%	35,4%			
	2. 36-50 years	8	23	25	42	38	136			
		2,5%	7,1%	7,7%	12,9%	11,7%	41,8%			
	3. Over 50 years	4	20	20	14	16	74			
		1,2%	6,2%	6,2%	4,3%	4,9%	22,8%			
Education	1. Completed primary school	2	7	7	9	9	34	325 100%	x^2=37,948 C=0,323	p=0,002 p<0,05
		0,6%	2,2%	2,2%	2,8%	2,8%	10,5%			
	2. Sec. professi. Accord.	18	25	18	37	28	126			
		5,5%	7,7%	5,5%	11,4%	8,6%	38,8%			
	3. Higher education	1	12	10	36	22	81			
		0,3%	3,7%	3,1%	11,1%	6,8%	24,9%			
	4. Higher education	2	12	24	12	17	67			
		0,6%	3,7%	7,4%	3,7%	5,2%	20,6%			
	5. MA / PhD Science	1	3	3	5	5	17			
		0,3%	0,9%	0,9%	1,5%	1,5%	5,2%			
Work experience	1. Up to 10 years	11	19	15	47	31	123	325 100%	x^2=20,321 C=0,243	p=0,061 p>0,05
		3,4%	5,8%	4,6%	14,5%	9,5%	37,8%			
	2. From 11 to 20 years	8	19	21	33	28	109			
		2,5%	5,8%	6,5%	10,2%	8,6%	33,5%			
	3. From 21 to 30 years	3	9	17	14	15	58			
		0,9%	2,8%	5,2%	4,3%	4,6%	17,8%			
	4. Over 30 years	2	12	9	5	7	35			
		0,6%	3,7%	2,8%	1,5%	2,2%	10,8%			

Source: Author

Table 11. provides data on whether the application of advanced technologies in the function of sustainable agricultural development in our country is sufficiently developed. Here, too, the prevailing opinion is that the

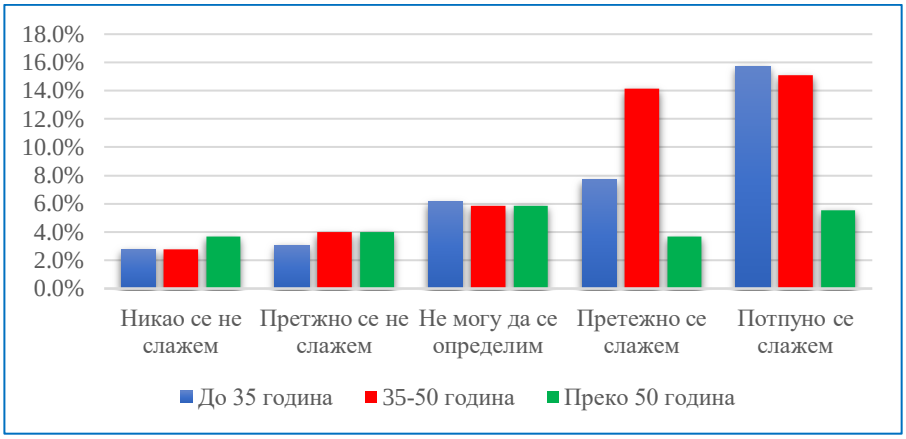
application of advanced technologies in the function of sustainable agricultural development in our country is not sufficiently developed, 55.4% of respondents have a positive attitude, while significantly less disagree or is indecisive.

We see that here, too, all independent variables are not significantly related to the attitudes of the respondents, the value of χ2 test and the contingency coefficient C show that gender (χ2 = 2,096, C = 0,182 and p = 0,718) and work experience (χ2 = 4,608, C = 0.114 and p = 0.970) are not statistically significantly related to the stated attitude of the respondents. This means that we do not have significant deviations regarding the mentioned position. On the other hand, the age (χ2 = 3.309, C = 0.097 and p = 0.914) and education (χ2 = 17.801, C = 0.220 and p = 0.336) are statistically related to the mentioned attitude. This means that, depending on the age and professional readiness, we have deviations in terms of the mentioned attitude.



Graph 15. The application of advanced technologies in the function of sustainable agricultural development in our country is not sufficiently developed - total percentages. Source: Author

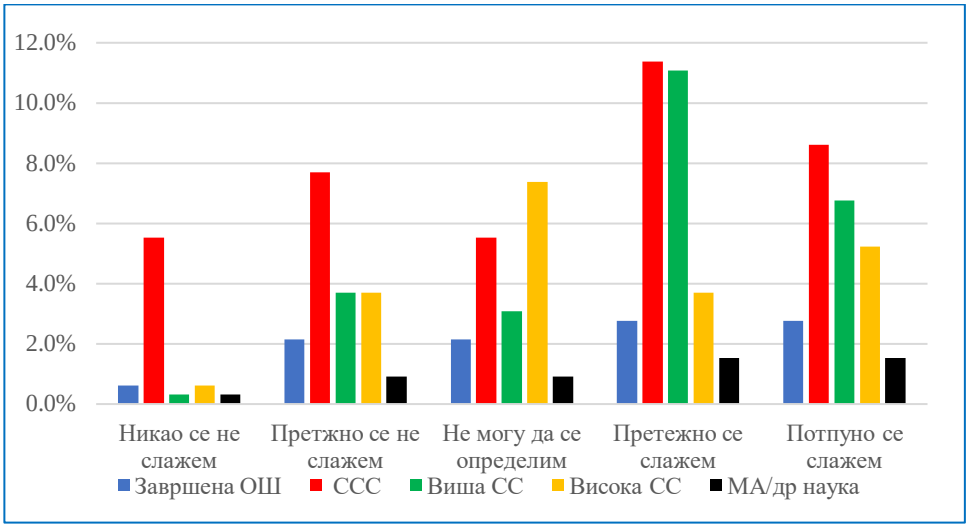
If you look at the results in Chart 16. the generation under 35 and the generation between 36 and 50 agree significantly more that the application of advanced technologies in the function of sustainable agricultural development is not sufficiently developed in our country. Generation under 35 21.5% agree that the application of advanced technologies in the function of sustainable agricultural development is not sufficiently developed, 5.2% are undecided and 8.6% do not agree with the mentioned position. The generation from 36 to 50 years of age, 34.6% agree with the mentioned attitude, 7.7% are undecided and 9.6% do not agree with the mentioned attitude. Generation over 50 years 9.1% agree with the mentioned attitude, 6.2% are undecided and 7.4% disagree with the mentioned attitude. As we can see with the generation over 50, we do not have a significant deviation in terms of the mentioned attitude.



Graph 16. The application of advanced technologies in the function of sustainable development of agriculture in our country is not sufficiently developed - years of life. Source: Author

Graph 17. provides data on the attitude of the development of the application of advanced technologies in the function of sustainable development of agriculture, depending on the education of the respondents. Among respondents with completed primary school, 5.6% agree with the mentioned attitude, 2.2% are undecided and 2.8% do not agree with the mentioned attitude. At the mid-level, 20.0% agree with the mentioned position, 5.5% are

undecided and 13.2% do not agree with the mentioned position. Among the respondents with higher professional knowledge, 17.9% agree with the mentioned attitude, 3.1% are undecided and 4.0% do not agree with the mentioned attitude. When it comes to higher education, 8.9% of respondents agree with the mentioned attitude, 7.4% are undecided and 4.3% do not agree with the mentioned attitude. Finally, 3.0% of respondents agree with the mentioned position, 0.9% are undecided and 1.2% do not agree with the mentioned position.



Graph 17. The application of advanced technologies in the function of sustainable development of agriculture in our country is not sufficiently developed – education. Source: Author

Respondents' attitude to the question: Investing money in advanced technologies is a sure way for sustainable agricultural development

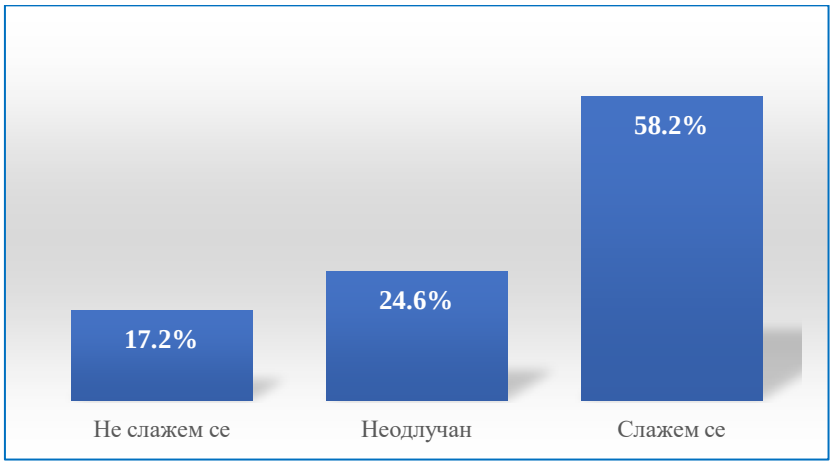
Table 12. provides data on the respondents' attitude to whether investing money in advanced technologies is a safe path for sustainable agricultural development. The majority of respondents agree that investing money in advanced technologies is 58.2% correct, 24.6% are undecided and 17.2% have a negative attitude. Here, all independent variables are not significantly related to the attitudes of the respondents, the value of the $\chi 2$ test and the contingency coefficient C show that gender ($\chi 2 = 1.602$, $C = 0.068$ and $p = 0.808$), age ($\chi 2 = 1.473$, $C = 0.067$ and $p = 0.831$) , age ($\chi 2 = 4.209$, $C = 0.113$ and $p = 0.838$), education ($\chi 2 = 8.348$, $C = 0.158$ and $p = 0.938$ and, work experience ($\chi 2 = 17.877$, $C = 0.228$ and $p = 0.119$) are not statistical This means that we do not have significant deviations in terms of this attitude.According to the data in the table we can conclude that regardless of gender, age, education and length of service most respondents agree with the view that investing money in advanced technologies are a sure path to sustainable agricultural development.

Table 12. Investing money in advanced technologies is a sure way for sustainable agricultural development

Socio-andragogical characteristics of the respondents		Investing money in advanced technologies is a sure way for sustainable agricultural development								
		1	2	3	4	5	In total		x^2 i C	p
Gender	1. Male	9	15	32	37	41	134	325 100%	x^2=1,473 C=0,067	p=0,831 p>0,05
		2,8%	4,6%	9,8%	11,4%	12,6%	41,2%			
	2. Female	9	23	48	60	51	191			
		2,8%	7,1%	14,8%	18,5%	15,7%	58,8%			
Years of life	1. Up to 35 years	7	15	25	38	30	115	325 100%	x^2=4,209 C=0,113	p=0,838 p>0,05
		2,2%	4,6%	7,7%	11,7%	9,2%	35,4%			
	2. 36-50 years	7	14	34	43	38	136			
		2,2%	4,3%	10,5%	13,2%	11,7%	41,8%			
		4	9	21	16	24	74			

	3. Over 50 years	1,2%	2,8%	6,5%	4,9%	7,4%	22,8%			
Education	1. Completed primary school	3	3	10	9	9	34	325 100%	x^2=8,348 C=0,158	p=0,938 p>0,05
		0,9%	0,9%	3,1%	2,8%	2,8%	10,5%			
	2. Sec. professi. Accord.	9	18	32	33	34	126			
		2,8%	5,5%	9,8%	10,2%	10,5%	38,8%			
	3. Higher education	4	8	19	26	24	81			
		1,2%	2,5%	5,8%	8,0%	7,4%	24,9%			
	4. Higher education	2	8	15	21	21	67			
		0,6%	2,5%	4,6%	6,5%	6,5%	20,6%			
	5. MA / PhD Science	0	1	4	8	4	17			
		0,0%	0,3%	1,2%	2,5%	1,2%	5,2%			
Work experience	1. Up to 10 years	10	13	25	46	29	123	325 100%	x^2=17,877 C=0,228	p=0,119 p>0,05
		3,1%	4,0%	7,7%	14,2%	8,9%	37,8%			
	2. From 11 to 20 years	4	14	32	30	29	109			
		1,2%	4,3%	9,8%	9,2%	8,9%	33,5%			
	3. From 21 to 30 years	1	8	18	11	20	58			
		0,3%	2,5%	5,5%	3,4%	6,2%	17,8%			
	4. Over 30 years	3	3	5	10	14	35			
		0,9%	0,9%	1,5%	3,1%	4,3%	10,8%			

Source: Author



Graph 18. Investing money in advanced technologies is a sure way for sustainable development of agriculture - total percentages. Source: Author

Respondents' attitude towards the question: The application of advanced technologies in the function of sustainable agricultural development is urgently needed today

Table 13. provides data on the attitude of the respondents whether the application of advanced technologies in the function of sustainable agricultural development is necessary today. The majority of respondents agree with the mentioned attitude of 61.5%, 20.9% are undecided and 17.5% of respondents have a

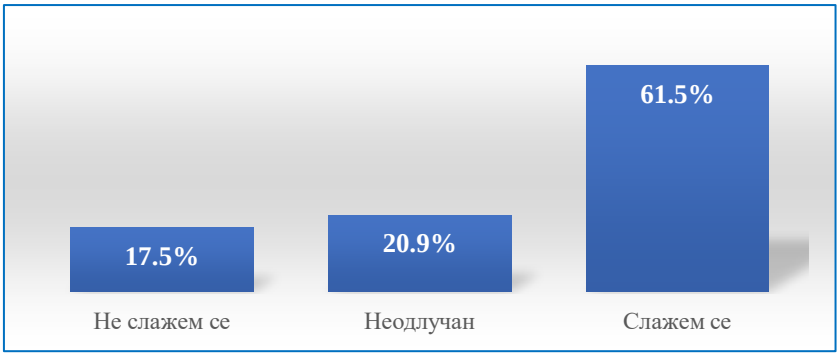
negative attitude. Here, not all independent variables are significantly related to respondents' attitudes. The value of $\chi 2$ test and contingency coefficient C show that gender ($\chi 2 = 5.451$, $C = 0.128$ and $p = 0.244$), age ($\chi 2 = 5.966$, $C = 0.134$ and $p = 0.651$), education ($\chi 2 = 24.417$, $C = 0.264$ and $p = 0.081$) and work experience ($\chi 2 = 8.161$, $C = 0.157$ and $p = 0.772$) are not statistically significantly related to the stated attitude of the respondents (attitude: The application of advanced technologies in the function of sustainable agricultural development is necessary today). This means that we do not have significant deviations regarding the mentioned position.

Table 13. The application of advanced technologies in the function of sustainable agricultural development is urgently needed today

Socio-andragogical characteristics of the respondents		The application of advanced technologies in the function of sustainable agricultural development is urgently needed today								
		1	2	3	4	5	In total		x^2 i C	p
Gender	1. Male	10	12	35	41	36	134	325 100 %	x^2=5,451 C=0,128	p=0,244 p>0,05
		3,1 %	3,7 %	10,8 %	12,6 %	11,1%	41,2%			
	2. Female	10	25	33	63	60	191			
		3,1 %	7,7 %	10,2 %	19,4 %	18,5 %	58,8%			
Years of life	1. Up to 35 years	8	9	27	37	34	115	325 100 %	x^2=5,966 C=0,134	p=0,651 p>0,05
		2,5 %	2,8 %	8,3%	11,4%	10,5 %	35,4%			
	2. 36-50 years	6	18	30	40	42	136			
		1,8 %	5,5 %	9,2%	12,3 %	12,9 %	41,8%			
	3. Over 50 years	6	10	11	27	20	74			
		1,8 %	3,1 %	3,4%	8,3%	6,2%	22,8%			
Education	1. Completed primary school	1	3	5	14	11	34	325 100 %	x^2=24,417 C=0,264	p=0,081 p>0,05
		0,3 %	0,9 %	1,5%	4,3%	3,4%	10,5%			
	2. Sec. professi. Accord.	14	14	26	36	36	126			
		4,3 %	4,3 %	8,0%	11,1%	11,1%	38,8%			
	3. Higher education	3	10	23	21	24	81			
		0,9 %	3,1 %	7,1%	6,5%	7,4%	24,9%			
	4. Higher education	2	7	9	31	18	67			
		0,6 %	2,2 %	2,8%	9,5%	5,5%	20,6%			
	5. MA / PhD Science	0	3	5	2	7	17			
		0,0 %	0,9 %	1,5%	0,6%	2,2%	5,2%			
Work experience	1. Up to 10 years	7	13	26	37	40	123	325 100 %	x^2=8,161 C=0,157	p=0,772 p>0,05
		2,2 %	4,0 %	8,0%	11,4%	12,3 %	37,8%			
		7	16	23	37	26	109			

	2. From 11 to 20 years	2,2 %	4,9 %	7,1%	11,4%	8,0%	33,5%			
	3. From 21 to 30 years	3	3	15	19	18	58			
		0,9 %	0,9 %	4,6%	5,8%	5,5%	17,8%			
	4. Over 30 years	3	5	4	11	12	35			
		0,9 %	1,5 %	1,2%	3,4%	3,7%	10,8%			

Source: Author



Graph 19. The application of advanced technologies in the function of sustainable agricultural development is necessary today - total percentages. Source: Author

Respondents' attitude to the question: I do not have enough financial resources to invest in advanced technologies in the function of sustainable agricultural development

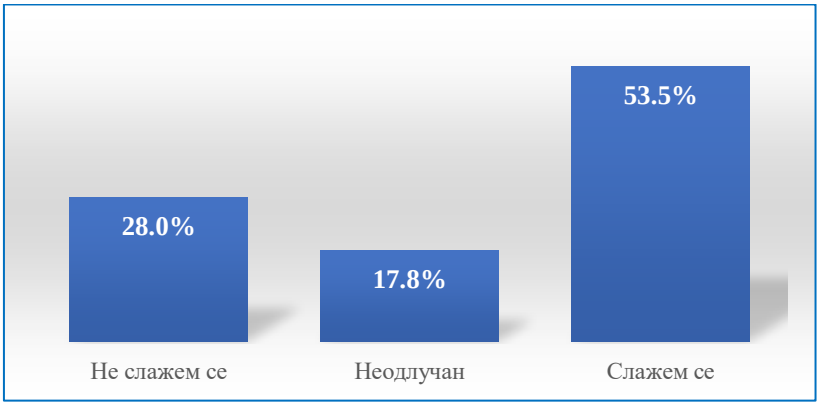
It is interesting in the current financial situation, which is not at all favorable when it comes to the financial resources of the population, to analyze the attitude of whether they have enough financial resources to invest in advanced technologies. Table 14. provides data on the attitude of the respondents whether they have sufficient financial resources for advanced technologies. Although most of the respondents agreed that the application of advanced technologies is necessary, unfortunately they do not have enough financial resources to realize this. This is also a reflection of the current financial situation in which individuals find themselves. Over 53% of respondents do not have the financial means for this type of savings. Here, too, not all independent variables are significantly related to respondents' attitudes. The value of $\chi 2$ test and contingency coefficient C show that gender ($\chi 2 = 4,577$, $C = 0,118$ and $p = 0,334$), age ($\chi 2 = 6,062$, $C = 0,135$ and $p = 0,640$) and work experience ($\chi 2 = 16,331$, $C = 0,219$) and $p = 0.177$) are not statistically significantly related to the stated attitude of the respondents (attitude: I do not have enough financial resources for the application of advanced technologies in the function of sustainable agricultural development). This means that we do not have significant deviations regarding the mentioned position.

Table 14. I do not have enough financial resources to invest in advanced technologies in the function of sustainable agricultural development

Socio-andragogical characteristics of the respondents		I do not have enough financial resources to invest in advanced technologies in the function of sustainable agricultural development								
		1	2	3	4	5	In total		x^2 i C	p
Gender	1. Male	17	25	27	24	41	134	325 100%	x^2=4,577 C=0,118	p=0,334 p>0,05
		5,2%	7,7%	8,3%	7,4%	12,6%	41,2%			
	2. Female	13	36	33	44	65	191			
		4,0%	11,1%	10,2%	13,5%	20,0%	58,8%			

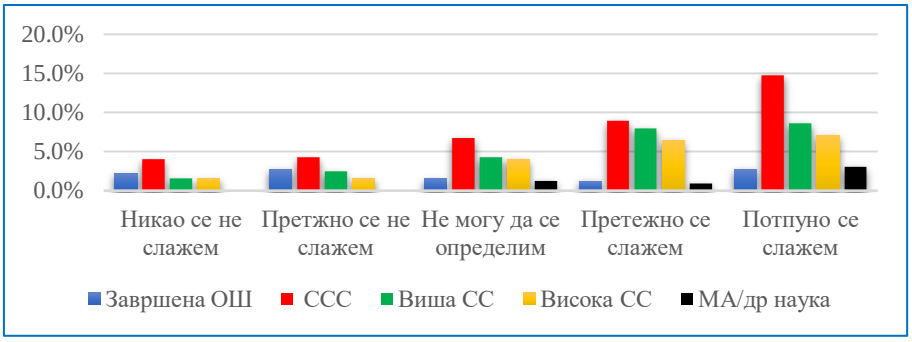
Years of life	1. Up to 35 years	10	20	20	30	35	115	325 100%	x^2=6,062 C=0,135	p=0,640 p>0,05
		3,1%	6,2%	6,2%	9,2%	10,8%	35,4%			
	2. 36-50 years	11	30	28	23	44	136			
		3,4%	9,2%	8,6%	7,1%	13,5%	41,8%			
	3. Over 50 years	9	11	12	15	27	74			
		2,8%	3,4%	3,7%	4,6%	8,3%	22,8%			
Education	1. Completed primary school	3	1	12	7	11	34	325 100%	x^2=59,671 C=0,394	p=0,000 p<0,05
		0,9%	0,3%	3,7%	2,2%	3,4%	10,5%			
	2. Sec. professi. Accord.	14	13	17	29	53	126			
		4,3%	4,0%	5,2%	8,9%	16,3%	38,8%			
	3. Higher education	4	12	19	23	23	81			
		1,2%	3,7%	5,8%	7,1%	7,1%	24,9%			
	4. Higher education	6	28	9	7	17	67			
		1,8%	8,6%	2,8%	2,2%	5,2%	20,6%			
	5. MA / PhD Science	3	7	3	2	2	17			
		0,9%	2,2%	0,9%	0,6%	0,6%	5,2%			
Work experience	1. Up to 10 years	11	25	22	32	33	123	325 100%	x^2=16,331 C=0,219	p=0,177 p>0,05
		3,4%	7,7%	6,8%	9,8%	10,2%	37,8%			
	2. From 11 to 20 years	7	17	25	20	40	109			
		2,2%	5,2%	7,7%	6,2%	12,3%	33,5%			
	3. From 21 to 30 years	6	15	10	7	20	58			
		1,8%	4,6%	3,1%	2,2%	6,2%	17,8%			
	4. Over 30 years	6	4	3	9	13	35			
		1,8%	1,2%	0,9%	2,8%	4,0%	10,8%			

Source: Author



Graph 20. I do not have enough financial resources to invest in advanced technologies in the function of sustainable agricultural development - total percentages. Source: Author

The independent variable education ($\chi 2$ = 59.671, C = 0.394 and p = 0.000) is statistically significantly related to the mentioned attitude. In other words, this means that the respondents 'answers differ statistically significantly with regard to the respondents' education.



Graph 21. I do not have enough financial resources for the application of advanced technologies in the function of sustainable agricultural development – education. Source: Author

By analyzing the data in Chart 21. we see that the attitude towards the financial resources for investing in advanced technologies also depends on the education of the respondents. Among the respondents with completed primary school, 5.6% agree with the mentioned attitude, 3.7% are undecided and 1.2% do not agree with the mentioned attitude. Among respondents with secondary education, 25.2% agree with the mentioned attitude, 5.2% are undecided and 8.3% do not agree with the mentioned attitude. Among respondents with higher education, 14.2% agree with the mentioned attitude, 5.8% are undecided and 4.9% do not agree with the mentioned attitude. Among respondents with a university degree, 7.4% agree with the mentioned attitude, 2.8% are undecided and 10.4% do not agree with the mentioned attitude. 1.2% of respondents agree with the mentioned attitude, 0.9% are undecided and 3.1% do not agree with the mentioned attitude. Such a drastic deviation in the attitude of the respondents is probably related to their income, it is assumed that respondents with higher education also have higher incomes.

Regression analysis and prognosis of the connection between the attitudes of the respondents and their socio-andragogical characteristics

This section will deal with multiple regression and its application in the prognosis of the relationship between the attitudes of respondents and their socio-andragogical characteristics: gender, age, education and work experience. The aim of regression analysis is to examine whether independent variables explain a significant part of the variability of a dependent variable, ie. whether there is a connection. Then to determine which part of the variability of the dependent variable can be explained by the independent variable, ie. bond strength. Finally, to determine the structure of the relationship and predict the values of the dependent variable. For analysis, we will perform a correlation to examine the relationship between dependent and independent variables, then calculate the coefficient of determination to represent the comprehensiveness of the model, ANOVA test to test the variance and linear relationship of at least one independent variable with the dependent. Based on the calculated parameters, we will determine the influence of independent variables on dependent ones.

In the further analysis, the calculation of the total correlation and the coefficient of determination will give an answer to the question of what percentage of this research included the dependent and independent variables, and how many percent of the variables remained unexplained. Also, a test will be done, whether there is a significant difference between the variances of the dependent and independent variables, and ANOVA test which gives the answer whether at least one independent variable is in a linear relationship with the dependent variable.

The application of advanced technologies in the function of sustainable agricultural development is the right choice and socio-andragogical characteristics of the respondents

The results of multiple regression between the independent variables and the first dependent variable and the view that the application of advanced technologies is the right choice are given in Table 16. In this table we see that the correlation coefficient R = 0.240. Judging by the coefficient of multiple correlation, the correlation between socio-andragogical characteristics, as predictor variables, and the attitude of the respondents, as criterion variables, is very low. The obtained result indicates that only 5.8% of the variance of the criteria can be explained with the help of the analyzed socio-andragogical characteristics of the respondents.

Table 15. Summarized results of regression analysis of predictor variables and criterion variables - Application of advanced technologies in the function of sustainable agricultural development is the right choice

Criterion variable	Multiple correlation coefficient (R)	Multiple Correlation Coefficient Square (R Sqare)	Adjusted Multiple Correlation Coefficient (Adjusted R Square)
Application of advanced technologies in the function of sustainable agricultural development is the right choice	0,240	0,058	0,046

Source: Author

Based on the obtained values on the test of significance of the coefficient of multiple determination (Table 16.), it can be concluded that the socio-andragogical characteristics of the respondents, as predictor variables, to some extent contribute to predicting the value of the criterion variable. The contribution of the criterion variables as a system is statistically significant, the value of the F-test is 4.902 and it is statistically significant (p = 001, p <0.05).

Based on the obtained values of the t-test and standardized partial regression coefficients (Beta), it can be concluded that among the socio-andragogical characteristics of the respondents, the greatest contribution to predicting the values of the criterion variable is age (p <0.05). The partial contribution of gender, education and work experience is not statistically significant.

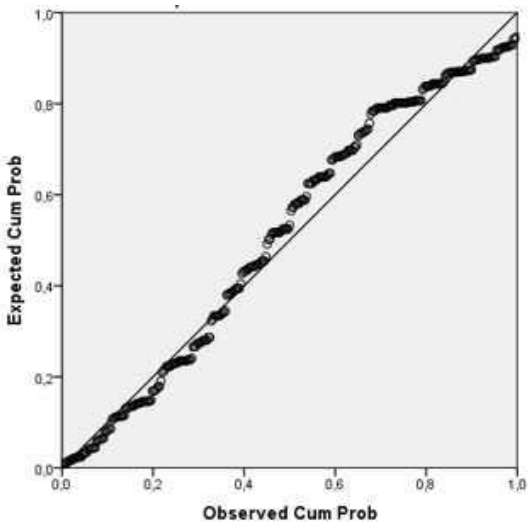
Table 16. Significance test of multiple determination coefficients - Application of advanced technologies in the function of sustainable agricultural development is the right choice. Source: Author

Analysis of variance	Sum of Square	Number of degrees of freedom (df)	Mean Square Deviation (Mean Square)	F-test	p
Regression	31,776	4	7,944	4,902	0,001
Residual (error)	518,532	320	1,620		
Total	550,308	324			

Table 17. Forecast of evaluation of isolated performance based on predictor characteristics - Application of advanced technologies in the function of sustainable agricultural development is the right choice.
Source: Author

Predictor variables	Non-standardized coefficients		Partial Standardized Regression Coefficient (Beta)	t-test	p
	B	Standard Error			
Gender	,204	,148	,077	1,378	,169
Years of life	-,569	,148	-,329	-3,851	,000
Education	,025	,066	,021	,378	,705
Work experience	,194	,113	,148	1,714	,088

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: The application of advanced technologies in the function of sustainable agricultural development is the right choice



Graph 22. Dispersion diagram: Application of advanced technologies in the function of sustainable development of agriculture is the right choice and socio-andragogical features. Source: Author

I expect that the application of advanced technologies in the function of sustainable development of agriculture will give good results and socio-andragogical characteristics of the respondents

The results of multiple regression between socio-andragogical characteristics and attitudes about the outcome of advanced technologies are given in Table 18. We see that here the correlation coefficient is R = 0.268, which means that the relationship between socio-andragogical characteristics, as predictor variables and the attitude of respondents, as criterion variables, very low. The obtained result indicates that only 7.2% of the variance of the criteria can be explained with the help of the analyzed socio-andragogical characteristics of the respondents.

Table 18. Summary results of regression analysis of predictor variables and criterion variables - I expect that the application of advanced technologies in the function of sustainable agricultural development will give good results. Source: Author

Criterion variable	Multiple correlation coefficient (R)	Multiple Correlation Coefficient Square (R Sqare)	Adjusted Multiple Correlation Coefficient (Adjusted R Square)
I expect that the application of advanced technologies in the function of sustainable agricultural development will give good results	0,268	0,072	0,060

Based on the obtained values on the test of significance of the coefficient of multiple determination (Table 19.), we can conclude that the socio-andragogical characteristics of the respondents, as predictor variables, to some extent contribute to predicting the value of the criterion variable. The value of the F-test is 6.179 and is statistically significant (p = 000, p <0.05), ie the contribution of the criterion variables as a system is statistically significant.

Table 19. Test of significance of multiple determination coefficients - I expect that the application of advanced technologies in the function of sustainable agricultural development will give good results. Source: Author

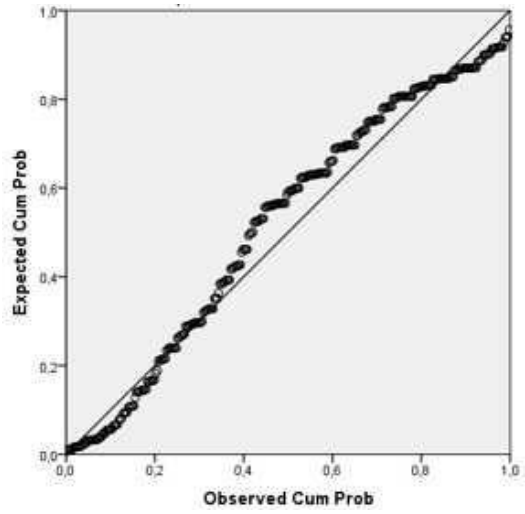
Analysis of variance	Sum of Square	Number of degrees of freedom (df)	Mean Square Deviation (Mean Square)	F-test	p
Regression	40,007	4	10,002	6,179	0,000
Residual (error)	517,980	320	1,619		
Total	557,988	324			

By analyzing the obtained values of t-test and standardized partial regression coefficients (Beta) (Table 20.), it can be concluded that among the socio-andragogical characteristics of the respondents the greatest contribution to forecasting the values of the criterion variable is age and education ($p < 0.05$). The partial contribution of gender and work experience is not statistically significant.

Table 20. Forecast of evaluation of isolated performance based on predictor characteristics - I expect that the application of advanced technologies in the function of sustainable agricultural development will give good results. Source: Author

Predictor variables	Non-standardized coefficients		Partial Standardized Regression Coefficient (Beta)	t-test	p
	B	Standard Error			
Gender	,203	,148	,076	1,369	,172
Years of life	-,344	,148	-,197	-2,328	,021
Education	,222	,066	,181	3,346	,001
Work experience	,010	,113	,008	,092	,926

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: I expect that the application of advanced technologies in the function of sustainable development of agriculture will give good results



Graph 23. Dissipation diagram: I expect that the application of advanced technologies in the function of sustainable agricultural development will give good results and socio-andragogical characteristics
Source: Author

The application of advanced technologies in the function of sustainable agricultural development guarantees quality agricultural production and socio-andragogical characteristics of the respondents

The results of multiple regression between socio-andragogical characteristics and the position on whether the application of advanced technologies guarantees quality agricultural production are given in Table 21. We see that the correlation coefficient R = 0.193, which means that the relationship between socio-andragogical characteristics, as predictor variables and the attitude of the respondents, as criterion variables, is very low. The

obtained result indicates that only 3.7% of the variance of the criteria can be explained with the help of the analyzed socio-andragogical characteristics of the respondents.

Table 21. Summarized results of regression analysis of predictor variables and criterion variables - Application of advanced technologies in the function of sustainable agricultural development guarantees quality agricultural production. Source: Author

Criterion variable	Multiple correlation coefficient (R)	Multiple Correlation Coefficient Square (R Sqare)	Adjusted Multiple Correlation Coefficient (Adjusted R Square)
Application of advanced technologies in the function of sustainable agricultural development guarantees quality agricultural production	0,193	0,037	0,025

Based on the obtained values on the test of significance of the coefficient of multiple determination (Table 22.), we can conclude that the socio-andragogical characteristics of the respondents, as predictor variables, to some extent contribute to predicting the value of the criterion variable. The value of the F-test is 3.084 and is statistically significant ($p = 016$, $p < 0.05$), ie the contribution of the criterion variables as a system is statistically significant.

Table 22. Significance test of multiple determination coefficients - Application of advanced technologies in the function of sustainable agricultural development guarantees quality agricultural production. Source: Author

Analysis of variance	Sum of Square	Number of degrees of freedom (df)	Mean Square Deviation (Mean Square)	F-test	p
Regression	20,649	4	5,162	3,084	0,016
Residual (error)	535,578	320	1,674		
Total	556,228	324			

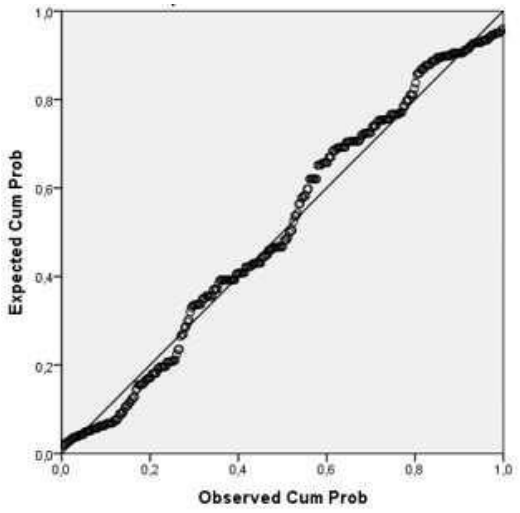
By analyzing the obtained values of the t-test and standardized partial regression coefficients (Beta) (Table 23.), it can be concluded that among the socio-andragogical characteristics of the respondents, the greatest contribution to predicting the values of the criterion variable is age ($p < 0.05$). The partial contribution of gender, education and work experience is not statistically significant.

Table 23. Forecast of evaluation of isolated performance based on predictor characteristics - Application of advanced technologies in the function of sustainable development of agriculture guarantees quality agricultural production. Source: Author

Predictor variables	Non-standardized coefficients		Partial Standardized Regression Coefficient (Beta)	t-test	p
	B	Standard Error			
Gender	,049	,151	,018	,325	,745
Years of life	-,439	,150	-,252	-2,924	,004
Education	,126	,067	,103	1,862	,064
Work experience	,193	,115	,147	1,681	,094

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: The application of advanced technologies in the function of sustainable agricultural development guarantees quality production



Graph 24. Dispersion diagram: Application of advanced technologies in the function of sustainable development of agriculture guarantees quality production and socio-andragogical characteristics
Source: Author

The application of advanced technologies in the function of sustainable development of agriculture can be successfully realized and the socio-andragogical characteristics of the respondents

The results of multiple regression between socio-andragogical characteristics and attitudes about the success of the application of advanced technologies are given in Table 24. Based on the presented data, we see that the correlation coefficient R = 0.072, which tells us that the correlation is extremely weak. The obtained result indicates that only 0.5% of the variance of the criteria can be explained with the help of the analyzed socio-andragogical characteristics of the respondents.

Table 24. Summary results of regression analysis of predictor variables and criterion variables - Application of advanced technologies in the function of sustainable agricultural development can be successfully realized. Source: Author

Criterion variable	Multiple correlation coefficient (R)	Multiple Correlation Coefficient Square (R Sqare)	Adjusted Multiple Correlation Coefficient (Adjusted R Square)
Application of advanced technologies in the function of sustainable agricultural development can be successfully realized	0,072	0,005	-0,007

The value of the F-test is 0.417 (Table 25.), which shows that the coefficient of multiple determination is not statistically significant, p = 0.796 or p> 0.05. Based on that, it can be concluded that the calculated statistical indicators do not have all the statistical properties.

Table 25. Significance test of multiple determination coefficients - Application of advanced technologies in the function of sustainable development of agriculture can be successfully realized. Source: Author

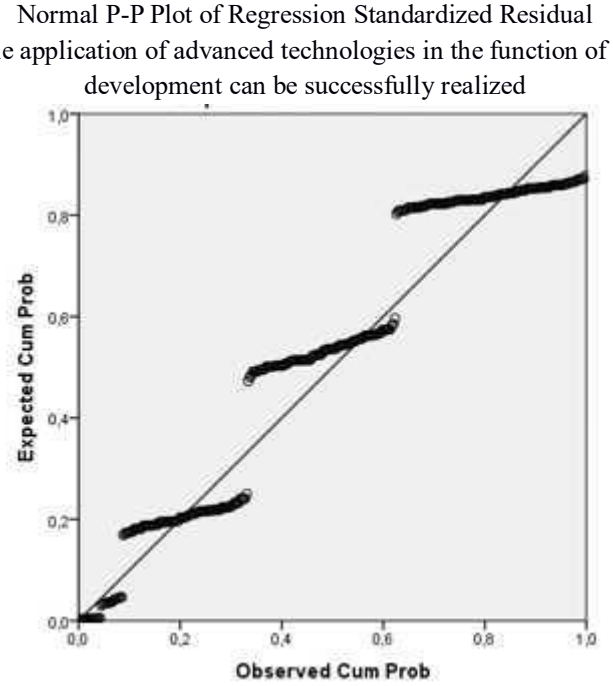
Analysis of variance	Sum of Square	Number of degrees of freedom (df)	Mean Square Deviation (Mean Square)	F-test	p
Regression	1,979	4	,495	4,17	0,796
esidual (error)	379,609	320	1,186		
Total	381,588	324			

In this case, based on the obtained values of the t-test and standardized partial regression coefficients (Beta) (Table 26.), we can conclude that the partial contribution of socio-andragogical characteristics of respondents, and gender, and age, and education, and work experience are not statistically significant. This means that on the basis of socio-andragogical characteristics, the attitudes of the respondents regarding the given criterion cannot be predicted.

Table 26. Forecast of evaluation of isolated performance based on predictor characteristics - Application of advanced technologies in the function of sustainable development of agriculture can be successfully realized. Source: Author

Predictor variables	Non-standardized coefficients		Partial Standardized Regression Coefficient (Beta)	t-test	p
	B	Standard Error			
Gender	,135	,127	,061	1,066	,287
Years of life	,007	,126	,005	,056	,956
Education	-,031	,057	-,031	-,552	,581
Work experience	,022	,097	,020	,225	,822

In this case, too, the obtained results of the regression analysis show that the stated socio-andragogical characteristics are not a significant predictor of reliability when it comes to the outcome of the respondents' attitudes. They cannot explain more than 0.05% of the variance of the criteria, which is a negligible value.



Graph 25. Dispersion diagram: Application of advanced technologies in the function of sustainable development of agriculture can be successfully realized and socio-andragogical features. Source: Author

The application of advanced technologies in the function of sustainable development of agriculture in our country is not sufficiently developed and the socio-andragogical characteristics of the respondents

The results of multiple regression between socio-andragogical characteristics and attitudes about the development of advanced technologies are given in Table 27. It can be seen that the correlation between social and andragogical characteristics and attitudes of respondents is very low, multiple correlation coefficient R = 0.111 and predictors explain only 1 , 2% variance of the criteria.

Table 27. Summarized results of regression analysis of predictor variables and criterion variables - Application of advanced technologies in the function of sustainable development of agriculture in our country is not sufficiently developed. Source: Author

Criterion variable	Multiple correlation coefficient (R)	Multiple Correlation Coefficient Square (R Sqare)	Adjusted Multiple Correlation Coefficient (Adjusted R Square)
Application of advanced technologies in the function of sustainable development of agriculture in our country is not sufficiently developed	0,111	0,012	0,000

Table 28. shows the values of the F-test. As we can see, the value of the F-test is 0.996, which is not statistically significant (p = 0.410 or p> 0.05). Based on the obtained t-test results and standardized partial regression coefficients (Beta) (Table 29.), it can be concluded that among the socio-andragogical characteristics of the respondents, in this case none contributes to predicting the value of the criterion variable (p> 0.05). The partial contribution of gender, age, education and work experience is not statistically significant.

Table 28. Test of significance of multiple determination coefficients - Application of advanced technologies in the function of sustainable development of agriculture in our country is not sufficiently developed. Source: Author

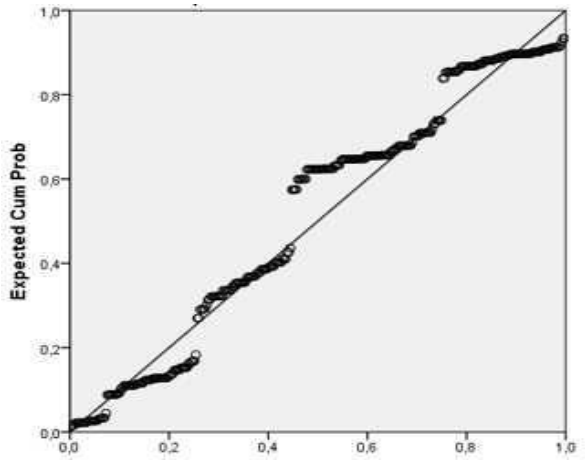
Analysis of variance	Sum of Square	Number of degrees of freedom (df)	Mean Square Deviation (Mean Square)	F-test	p
egression	6,208	4	1,552	0,996	0,410
Residual (error)	498,820	320	1,559		
Total	505,028	324			

Table 29. Forecast of evaluation of isolated performance based on predictor characteristics - Application of advanced technologies in the function of sustainable development of agriculture in our country is not sufficiently developed. Source: Author

Predictor variables	Non-standardized coefficients		Partial Standardized Regression Coefficient (Beta)	t-test	p
	B	Standard Error			
Gender	-,004	,145	-,001	-,025	,980
Years of life	,002	,145	,001	,014	,989
Education	,079	,065	,068	1,210	,227

Work experience	-,110	,111	-,087	-,990	,323

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: The application of advanced technologies in the function of sustainable agricultural development in our country is not sufficiently developed



Graph 26. Dispersion diagram: The application of advanced technologies in the function of sustainable development of agriculture in our country is not sufficiently developed and socio-andragogical features
Source: Author

Investing money in advanced technologies is a sure way for sustainable development of agriculture and socio-andragogical characteristics of respondents

The results of multiple regression between socio-andragogical characteristics and attitudes about investing money in advanced technologies are given in Table 30. It can be seen that the correlation between socio-andragogical characteristics and attitudes of respondents is very low, multiple correlation coefficient R = 0.135 and predictors explain only 1.8% variance of the criteria.

Table 30. Summary results of regression analysis of predictor variables and criterion variables - Investing money in advanced technologies is a safe way for sustainable agricultural development. Source: Author

Criterion variable	Multiple correlation coefficient (R)	Multiple Correlation Coefficient Square (R Sqare)	Adjusted Multiple Correlation Coefficient (Adjusted R Square)
Investing money in advanced technologies is a safe way for sustainable agricultural development	0,135	0,018	0,006

The value of the F-test is 1,481 (Table 31.), which shows that the coefficient of multiple determination is not statistically significant, p = 0.208 or p> 0.05. Based on that, it can be concluded that the calculated statistical indicators do not have all the statistical properties.

Table 31. Significance test of multiple determination coefficients - Investing money in advanced technologies is a safe way for sustainable agricultural development . Source: Author

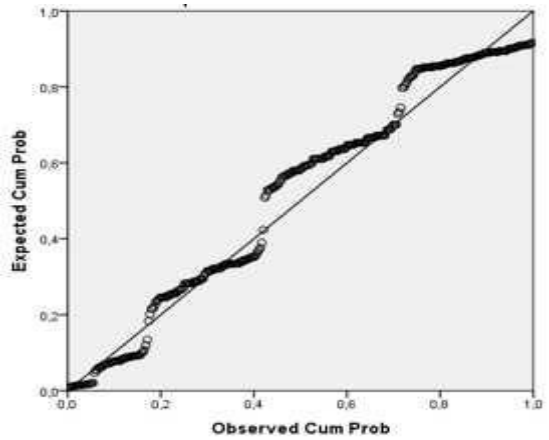
Analysis of variance	Sum of Square	Number of degrees of freedom (df)	Mean Square Deviation (Mean Square)	F-test	p
Regression	8,054	4	2,014	1,481	0,208
Residual (error)	435,103	320	1,360		
otal	443,157	324			

Based on the obtained t-test results and standardized partial regression coefficients (Beta) (Table 32.), it can be concluded that among the socio-andragogical characteristics of the respondents, in this case none has a contribution to predicting the value of the criterion variable (p> 0.05). . The partial contribution of gender, age, education and work experience is not statistically significant.

Table 32. Predicted performance evaluation forecast based on predictor characteristics - Investing money in advanced technologies is a safe way for sustainable agricultural development. Source: Author

Predictor variables	Non-standardized coefficients		Partial Standardized Regression Coefficient (Beta)	t-test	p
	B	Standard Error			
Gender	,060	,136	,025	,440	,660
Years of life	-,155	,135	-,100	-1,147	,252
Education	,113	,061	,103	1,854	,065
Work experience	,174	,104	,148	1,677	,095

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Investing money in advanced technologies is a sure way to sustainable agricultural development



Graph 27. Dispersion diagram: Investing money in advanced technologies is a safe way for sustainable development of agriculture and socio-andragogical features
Source: Author

The application of advanced technologies in the function of sustainable development of agriculture today is necessarily necessary and socio-andragogical characteristics of the respondents

In this case we have results similar to the previous one. The results of multiple regression between socio-andragogical characteristics and the attitude of whether the application of advanced technologies is necessary in the function of sustainable agricultural development are given in Table 33. It can be seen that here the correlation

between socio-andragogical characteristics and the attitude of respondents is very low. R = 0.086 and that the predictors explain only 0.7% of the variance of the criteria.

Table 33. Summarized results of regression analysis of predictor variables and criterion variables - Application of advanced technologies in the function of sustainable agricultural development is urgently needed today. Source: Author

Criterion variable	Multiple correlation coefficient (R)	Multiple Correlation Coefficient Square (R Sqare)	Adjusted Multiple Correlation Coefficient (Adjusted R Square)
Application of advanced technologies in the function of sustainable agricultural development is urgently needed today	0,086	0,007	-0,005

The value of the F-test is 0.594 (Table 34.), which shows that the coefficient of multiple determination is not statistically significant, p = 0.667 or p> 0.05. Based on that, it can be concluded that the calculated statistical indicators do not have all the statistical properties.

Table 34. Significance test of multiple determination coefficients - Application of advanced technologies in the function of sustainable development of agriculture is urgently needed today. Source: Author

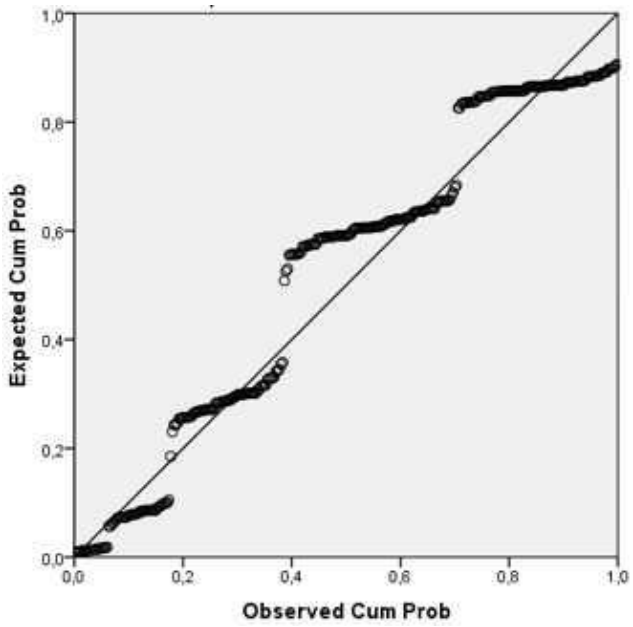
Analysis of variance	Sum of Square	Number of degrees of freedom (df)	Mean Square Deviation (Mean Square)	F-test	p
egression	3,373	4	,843	0,594	0,667
Residual (error)	454,055	320	1,419		
Total	457,428	324			

Here, too, based on the obtained t-test results and standardized partial regression coefficients (Beta) (Table 35.), it can be concluded that among the socio-andragogical characteristics of the respondents, in this case none contributes to predicting the value of the criterion variable (p> 0, 05). The partial contribution of gender, age, education and work experience is not statistically significant.

Table 35. Forecast of evaluation of isolated performance based on predictor characteristics - Application of advanced technologies in the function of sustainable agricultural development is urgently needed today. Source: Author

Predictor variables	Non-standardized coefficients		Partial Standardized Regression Coefficient (Beta)	t-test	p
	B	Standard Error			
Gender	,155	,139	,064	1,116	,265
Years of life	-,136	,138	-,086	-,984	,326
Education	,052	,062	,047	,843	,400
Work experience	,093	,106	,077	,875	,382

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: The application of advanced technologies in the function of sustainable agricultural development is urgently needed today



Graph 28. Diagram of scattering: Application of advanced technologies in the function of sustainable development of agriculture today is necessarily necessary and socio-andragogical features
Source: Author

I do not have enough financial resources to invest in advanced technologies in the function of sustainable agricultural development and socio-andragogical characteristics of the respondents

The results of multiple regression between socio-andragogical characteristics and the attitude that we have enough funds to invest in advanced technologies are given in Table 36. It can be seen that the correlation between socio-andragogical characteristics and the attitude of respondents is very low, multiple correlation coefficient R = 0.212 and that predictors explain only 4.5% of the variance of the criteria.

Table 36. Summarized results of regression analysis of predictor variables and criterion variables - I do not have enough financial resources to invest in advanced technologies in the function of sustainable agricultural development. Source: Author

Criterion variable	Multiple correlation coefficient (R)	Multiple Correlation Coefficient Square (R Sqare)	Adjusted Multiple Correlation Coefficient (Adjusted R Square)
I do not have enough financial resources to invest in advanced technologies in the function of sustainable agricultural development	0,238	0,056	0,045

The value of the F-test is 4,783 (Table 37.), which shows that the coefficient of multiple determination is statistically significant, p = 0.001 or p <0.05. Based on that, it can be concluded that the calculated statistical indicators have statistical properties.

Table 37. Significance test of multiple determination coefficients - I do not have enough financial resources to invest in advanced technologies in the function of sustainable agricultural development.
Source: Author

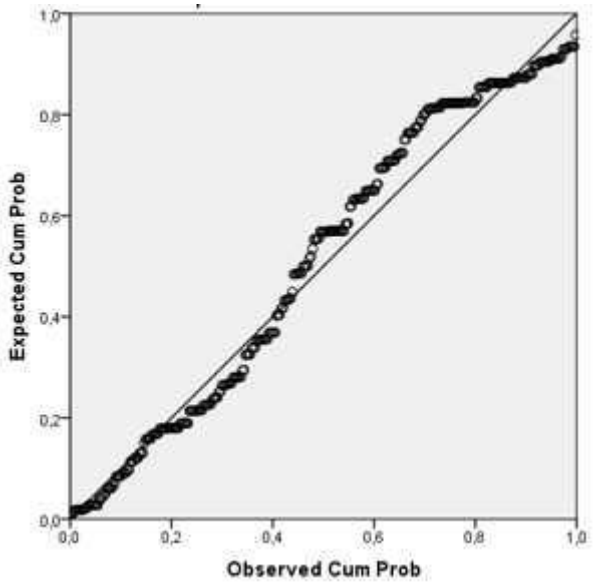
Analysis of variance	Sum of Square	Number of degrees of freedom (df)	Mean Square Deviation (Mean Square)	F-test	p
Regression	33,580	4	8,395	4,783	0,001
Residual (error)	561,632	320	1,755		
Total	595,212	324			

Based on the obtained results of the t-test and standardized partial regression coefficients (Beta) (Table 38.), it can be from the socio-andragogical characteristics of the respondents, only education has a statistical contribution to predicting the value of the criterion variable ($p < 0.05$). The partial contribution of gender, age, work experience is not statistically significant.

Table 38. Forecast of performance evaluation based on predictor characteristics - I do not have enough financial resources to invest in advanced technologies in the function of sustainable agricultural development.
Source: Author

Predictor variables	Non-standardized coefficients		Partial Standardized Regression Coefficient (Beta)	t-test	p
	B	Standard Error			
Gender	,218	,154	,079	1,414	,158
Years of life	-,045	,154	-,025	-,294	,769
Education	-,278	,069	-,219	-4,020	,000
Work experience	,049	,118	,036	,418	,676

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: I do not have enough financial resources to invest in advanced technologies in the function of sustainable agricultural development



Graph 29. Dispersion diagram: I do not have enough financial resources to invest in advanced technologies in the function of sustainable agricultural development and socio-andragogical characteristics
Source: Author

CONCLUSION

Gone are the days when ecology (environmental problems) and the consequences of human activities on the environment were dealt with only by scientists. Every inhabitant of the planet Earth today is surrounded by environmental problems, and we survive the consequences every day, through the air we breathe, water and food that we take into our body. Some of these consequences are manifested in the form of pollution and radiation to which we are exposed, through the lack of natural resources and the extinction of plant and animal species, along with disturbances in the global ecosystem and biogeochemical process.

The population of the planet Earth is constantly growing, which means that the need for urbanization and economic development is also growing. The construction and expansion of cities is taking up more and more space, and increasing amounts of natural resources are being used to meet the growing needs for production and consumption. The natural resources most commonly used for human activities are expendable. In the past, it was thought that global resources that represent a source of energy, such as water, ores, oil, natural gas, minerals, etc., would never be consumed. Today, having in mind the economic development, it has become known that the global reserves of these resources are running out, and thus humanity has found itself at a great turning point.

Through his activities, man changed the face of the planet Earth and significantly damaged the biosphere. On the vast surfaces of the planet, natural ecological systems have been completely destroyed. That little untouched nature, which still exists, is in great danger of disappearing under the pressure of modern man. Forests, which are the most complex and productive ecosystems, have always been under the impact of unreasonable exploitation of nature.

Global environmental problems will lead to changes in existing economic systems and lifestyle changes, due to the rapid degradation of the environment, caused by pollution resulting from increased industrial production and consumption. All factors in the process of creating and implementing new forms of decision-making and control that will carry out the process of change in accordance with the approach of sustainable development should be taken into account. These changes are long-term, related to the process of production and consumption. They often require a waiver of short-term individual profits in order to achieve long-term social benefits. Many changes will be driven by new policies and increased resource use costs, which will have an impact on investment and consumption. It should be borne in mind that these changes come at a price. It will be higher for developing countries and lower for developed economies that have adopted the concept of sustainable development in their legislation and policy.

The consequences of disturbing the ecological balance created under the influence of industrial agriculture, which implies intensive application of agrochemicals, means of heavy mechanization and various forms of specialization of agricultural production, are numerous and require adaptation and introduction of new agrotechnical and zootechnical measures for different directions.

The new stage of human development requires the preservation of all natural resources, the reduction of all forms of environmental pollution and the realization of the symbiosis of nature and man. In that sense, every human activity (especially those in the field of economy) must be harmonized with sustainable guidelines and directed towards rational behavior, reduction of consumption of non-renewable natural resources, reduction of environmental pollution with toxic substances, industrial and household waste, as well as application of certain strategies and methods, which allow to reduce pollution to a minimum and to make significant progress in the field of waste management.

Land is one of the basic structural components of ecosystems. Its characteristics significantly determine the structural and functional characteristics of the entire ecosystem. With its structure, the land enables the maintenance of the general structure of the ecosystem, ie it determines the level of complexity and structure of the phytocenosis, thus the land, through the structure of the phytocenosis, determines the function of the ecosystems themselves. On the other hand, with its physical, chemical and biological composition, the land determines the intensity of ecosystem metabolism, both the synthesis of organic matter (photosynthesis-production) and the decomposition of organic matter (decomposition-circulation of matter).

The Republic of Serbia has environmental problems. Many mistakes have been made and if we strive for the overall revival of the Republic of Serbia, we must not neglect the environment in which we live. In agriculture, there is great pressure to reduce production costs and improve productivity, in order to reduce the cost price and

make products competitive. The practice of agricultural production that is applied today is unsustainable for a long period of time. Numerous goals related to social and environmental problems can be addressed by changes in agriculture.

The priority of further development of agriculture should be: human health, environmental protection, food safety, preservation of natural energy sources, land and water, etc. Based on the defined, scientifically based methodology of the master's thesis, applied research methods, the following scientific findings were obtained:

The basic hypothesis that the application of advanced technologies in the field of sustainable agriculture contributes to the optimization of investments, reduction of losses and maximization of income has been confirmed.

The application of new information technologies (GPS) enables timely performance of work in agriculture, as well as prevention of problems. Thanks to precise data, the required doses of fertilizers, pesticides and water can be calculated, thus achieving significant savings. The use of IT in agriculture enables the increase and preservation of yields, as well as higher profits.

In precision agriculture, modern technical solutions related to the use of chemical pesticides in plant production are playing an increasing role. Based on the data obtained through sensors in the soil, it is possible to harmonize the amount of pesticides with the needs of plants, which reduces costs and protects the environment from pollution to a greater extent.

The advantages of "smart" agriculture are: saving money and time, controlled production conditions and reduced labor force.

It has been proven that without the application of advanced technologies in the field of sustainable agriculture, we cannot have investment optimization, reduction of losses and increase of income, which indicates the interconnection of advanced technologies and sustainable agriculture.

The use of GIS in agriculture in the Republic of Serbia has so far been more at the project level than at the system level. Despite the poor state of the Serbian agricultural sector, the benefits of introducing GIS into the agricultural management system would be manifold. Based on all indicators, we can conclude that the level of application and adoption of advanced technologies in the Republic of Serbia is still at a low level.

Empirical research has confirmed that most respondents think that the following technologies are necessary and that their application in the function of sustainable agricultural development can be realized. It can be said that this is a unique position, although the paper shows that there are certain differences on some issues according to age, level of education, length of work experience.

The conclusion is that the only way to apply advanced technologies is in the function of sustainable development of agriculture through the creation of general conditions necessary for the development of all segments of the economy and society that can affect the development of sustainable agriculture.

Through empirical research, all hypotheses were confirmed:

H1: when it comes to the application of advanced technologies in the function of sustainable agricultural development, most respondents agree that the application of advanced technologies is necessary. Most agree with the view that it is possible to successfully implement advanced technologies;

H2: when it comes to the advantage of using advanced technologies, most respondents agree that it is necessary and that they have confidence in the application of advanced technologies, but unfortunately they do not have enough financial resources to implement it;

H3: when it comes to the result of the application of the following technologies, most respondents agree that the application of the same enables quality and healthy agricultural production;

H4: when it comes to the degree of application and adoption of the following technologies, most respondents agree that at the moment it is still at a low level in our country.

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