
MARKET PERSPECTIVES AND SUSTAINABLE AGRICULTURE IN THE CASE OF THE REPUBLIC OF SERBIA

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ABSTRACT

Sustainable agriculture (SA) represents an ecological and economic development path with the aim of applying the best agricultural practices and technologies for the production of healthy food, increasing productivity and competitiveness on the market. The aim of the work is to research the perspectives of the market and SA in the territory of Serbia - Mačva. The research was conducted through a survey with 26 questions and 110 respondents. Analysis of the results shows that young people (50%) are familiar with the concepts of SA (57%) and circular economy (50%). Respondents are interested in SA, purchasing products or starting production, with the main motives: health and environmental protection. The main problems are the high price and poor financial support. For the development of sustainable agriculture, education on the implementation of the circular economy in sustainable agriculture systems, financial support and the availability of the necessary inputs for production are necessary.

Introduction

The term sustainable agricultural development appeared in response to changes in the practice and policy of agricultural development on a global scale, which relate to the longest possible survival of agricultural systems (Vujičić i sar., 2006). Sustainable agriculture implies the use of various technologies, measures and methods in agriculture, which have a positive effect on: increasing the productivity and profitability of agricultural products, reducing pollution and other negative effects, but also the

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preservation and rational use of environmental resources (water, air, soil, biodiversity, etc.) (Santiteerakul et al., 2020). The European Union has defined decarbonization by 2050 as its long-term strategic development goal, while one of the ways to achieve carbon neutrality is the transition from a linear to a circular economy (Ignjatović et al. 2024a). In addition to contributing to the fight against climate change, reducing pollution and using resources in a sustainable way (Ignjatović et al, 2024b), the circular economy requires significant financial investments by all actors and changes in the concept of business model (Blagojević et al., 2024). There is increasing concern regarding the negative impact of conventional agricultural production on the environment, so the impact of production practices on various factors is being observed, where the characteristics of the soil, consumption of non-renewable resources and environmental pollution are primarily in the center of attention (Sanaullah et al., 2020; Janković & Golubović, 2024; Lakićević et al., 2022; Pantović et al., 2023). The difference between sustainable and conventional production prioritizes soil fertility, pest control and energy consumption. The name conventional agriculture is used in the discursive construction as an alternative approach to agriculture (ie an alternative to conventional agriculture) (Giller et al., 2017). The problems with population growth and the growing need for food certainly go hand in hand with conventional production, and these needs are shown by numerous researches (Tripathi et al., 2019; Slavković et al., 2024; Elder i Hayashi, 2018). That is why there is a growing awareness of the importance of sustainable agriculture, and the evidence of this is the increase in the use of these practices in recent times (Clark et al., 2017; Chen et al., 2009). Reduced tillage increases organic carbon and at the same time limits greenhouse gas emissions (Curtin et al., 2000; Kumara et al., 2023), while integrated nutrient management increases yield and soil carbon and enables better availability of plant nutrients (Choudhury et al., 2018).

Accordingly, the aim of this paper is to explore the perspectives of the market and sustainable agriculture on the territory of the Republic of Serbia in the Mačva region. The task of the questionnaire is to explore the awareness of young people (students) about the market and sustainable agriculture.

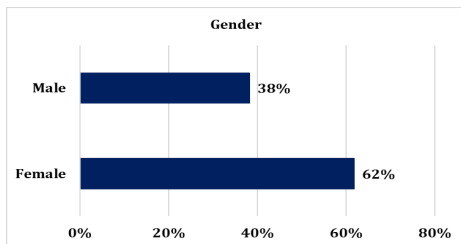
Materials and methods

The scientific contribution of this paper relates to research into the awareness of young people (students) about the market and sustainable agriculture. The research was conducted on the territory of the Republic of Serbia (Mačva District), based on surveyed students and employees in vocational education in the city of Šabac. The survey period is September-November 2024. The data collection process used a quantitative approach to surveying the target group in the form of a closed, anonymous questionnaire and a statistical method through the sample method. The survey is based on an indirect, random sample through 26 questions. The total number of respondents who participated in the survey was 110. The summarized data were processed through descriptive and graphical analysis.

Results

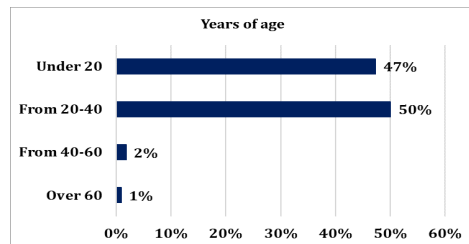
In accordance with the number of respondents, i.e. 110 respondents, in percentage terms, 38% of respondents are male, and 62% are female (Figure 01). For the age structure of the respondents, four defined groups were used: the first group up to 20 years old, the second group from 20-40 years old, the third group from 40-60 years old and the fourth group over 60 years old (Figure 02). The first group participates with 47% of the respondents (52), the second group with 50% of the respondents (55), while in the third group there are only 2% of the respondents (2), or 1% of the respondents (1) in the fourth group.

Figure 01. Gender



Source: Authors

Figure 02. Age

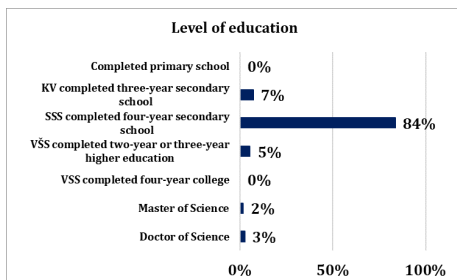


Source: Authors

When it comes to education level, the largest number of respondents has secondary vocational education 84% (92), which is in correlation with the target group of respondents, which are young people. Then, 7% of respondents (8) have completed secondary school, 5% of respondents (6) have completed college or university, then 3% have PhDs (3) and 2% have master's degrees (2). The level of education with completed primary school and completed university is not recorded (0%) (Figure 03).

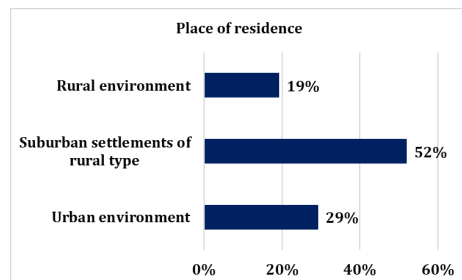
The place of residence of the respondents includes urban and rural areas and suburban settlements (Figure 04). The analysis determined that the largest number of respondents lives in suburban settlements, 52% (57), while 29% of respondents (32) live in urban areas, and 19% of respondents (21) live in rural areas.

Figure 03. Level of education



Source: Authors

Figure 04. Place of residence

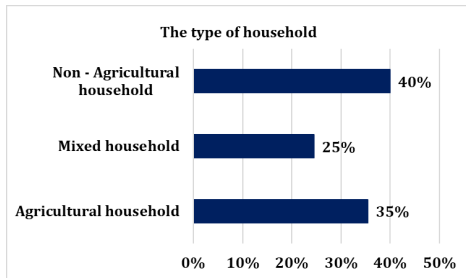


Source: Authors

When asked about the type of household in which respondents live (agricultural, non-agricultural and mixed households), the largest number of respondents live in non-agricultural households, 40% (44), while 35% (39) of respondents live in agricultural households, and 25% (27) in mixed households (Figure 05).

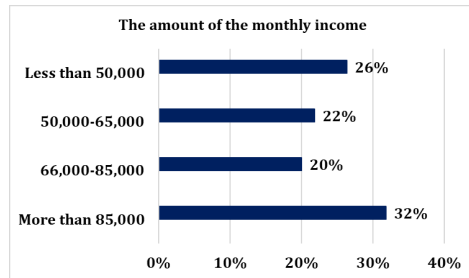
The amount of monthly income distributed into four groups is shown in Figure 06. An analysis of the respondents' income shows that the first group of incomes of less than 50,000 includes 26% of respondents (29). The second group (incomes between 50,000-65,000 dinars) includes 22% of respondents (24). 20% of respondents (22) have incomes between 65,000-85,000 dinars, which belong to the third group. The fourth group with monthly incomes above 85,000 dinars is also the largest group by affiliation, accounting for 32% of respondents (35).

Figure 05. Type of household in which you live



Source: Authors

Figure 06. Amount of monthly income

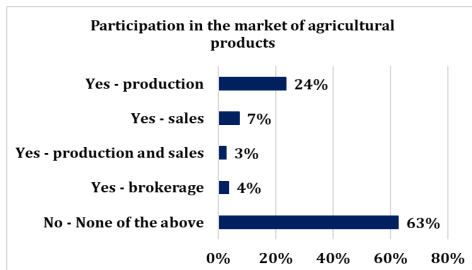


Source: Authors

Analyzing participation in the agricultural market, it is concluded that 69 respondents (63%) do not participate in the market, while 24% of respondents (26) participate as producers, 7% of respondents (8) as sellers, 4% of respondents (4) participate as intermediaries, while 3% of respondents (3) participate as both producers and sellers (Figure 07).

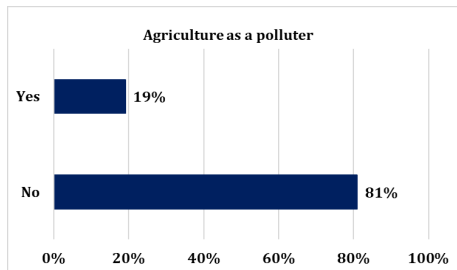
When asked whether respondents think that agriculture is one of the polluters, as many as 81% (89) of respondents think that it is not, while 19% (21) of respondents answer in the affirmative (Figure 08).

Figure 07. Are you a participant in the agricultural market?



Source: Authors

Figure 08. Do you think that agriculture is one of the polluters of the environment?

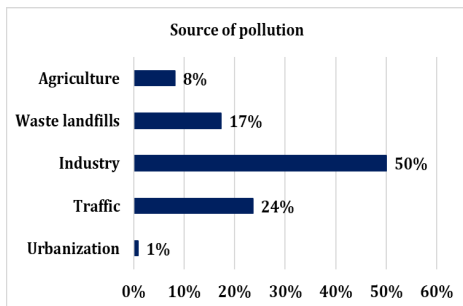


Source: Authors

According to the selected sources of pollution, listed in the question, 50% of respondents (55) answered that the biggest polluter is industry (Figure 09). This is followed by traffic (24%, i.e. 26 respondents), landfills (17%, i.e. 19 respondents). According to the respondents, the smallest polluters are urbanization (1%, i.e. 1 respondent) and agriculture (8%, i.e. 9 respondents).

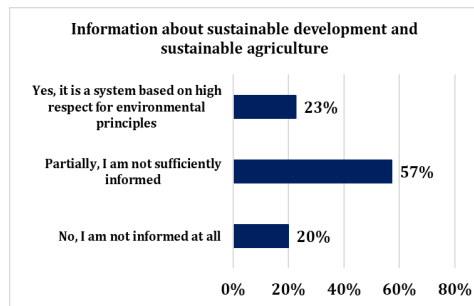
As many as 57% of respondents (63) believe that they are partially or insufficiently informed about sustainable development and sustainable agriculture (Figure 10). In addition, 23% of respondents (25) believe that they are aware of it, and that it is a system based on high respect for environmental principles, while 20% of respondents (22) believe that they are not informed at all.

Figure 09. Which of these sources do you think is the biggest polluter?



Source: Authors

Figure 10. Are you aware of basic information about sustainable development and sustainable agriculture?

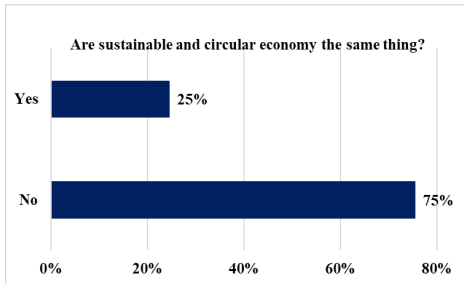


Source: Authors

Regarding the equivalence of studying sustainable and circular economy, 75% of respondents (83) believe that they are different things, while 25% of respondents (27) believe that they are the same concepts (Figure 11).

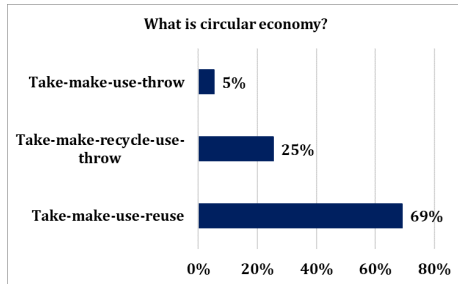
The definition of the concept of circular economy is the use and reuse of raw materials, where the largest number of respondents (69%, or 76) correctly understand it as take-make-use-reuse, while 25% of respondents (28) understand it as take-make-recycle-use-throw away and 5% of respondents (6) understand it as take-make-use-throw away (Figure 12).

Figure 11. Do you believe that sustainable and circular economy are the same?



Source: Authors

Figure 12. What is a circular economy?

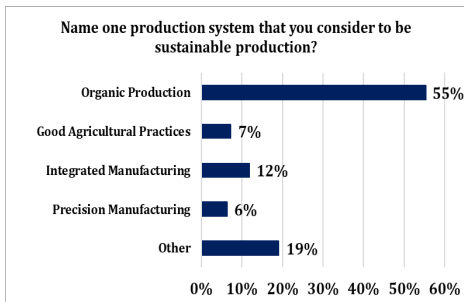


Source: Authors

Regarding the survey of respondents on their knowledge of various systems that belong to sustainable production, 55% of respondents (61) think that it is organic agriculture, 7% of respondents (8) that it is good agricultural practice, 12% of respondents (13) think that it is integral production and 6% of respondents (7) opted for precision agriculture. As many as 19% of respondents (21) believe that none of the above systems belong to sustainable agriculture (Figure 13).

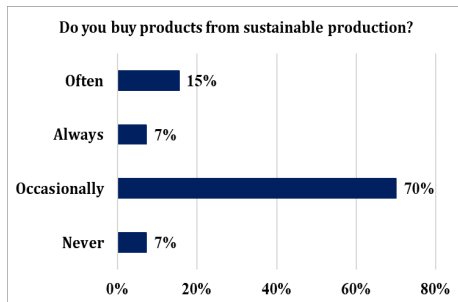
When asked to what extent respondents buy products from sustainable production, 15% (17) of respondents buy often, 7% of respondents (8) buy constantly or never buy, while the largest number of respondents are occasional buyers of these products (70% of respondents, i.e. 77 respondents) (Figure 14).

Figure 13. Name at least one production system that you believe belongs to sustainable production?



Source: Authors

Figure 14. Do you buy products from sustainable production?



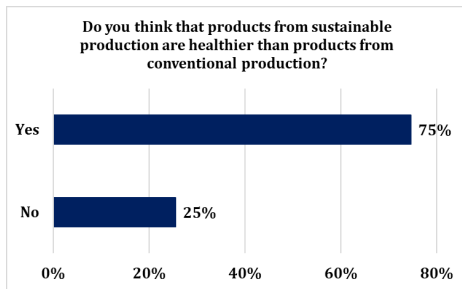
Source: Authors

Regarding the opinion on healthier products from sustainable production, 75% of respondents (82) believe that they are healthier than products from conventional production, and 25% of respondents (28) believe that they are not (Figure 15).

According to the given motives for purchasing products from sustainable production, the largest number of respondents, 45% of respondents (50), chose the health safety of the product. Furthermore, 29% of respondents (32) chose the quality of the product,

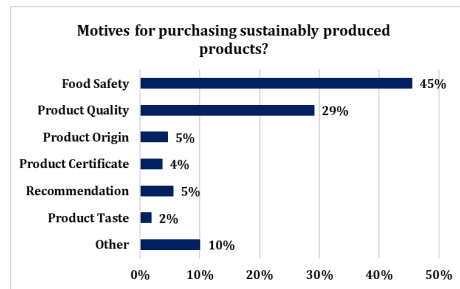
5% of respondents (5) chose the origin of the product, 4% of respondents (4) chose the certified product, 5% of respondents (6) chose the recommendation motive, 2% of respondents (2) chose the taste of the product, and 10% of respondents (11) believed that the motives for purchasing were other (Figure 16).

Figure 15. Do you think that products from sustainable production are healthier than products from conventional production?



Source: Authors

Figure 16. Motives for purchasing products from sustainable production?

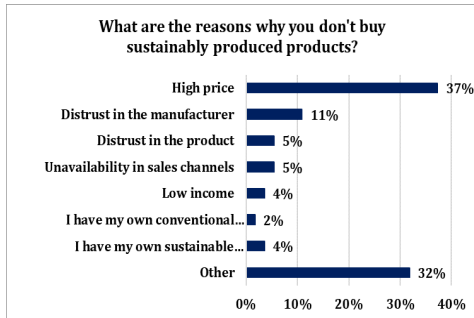


Source: Authors

Regarding the reasons why respondents do not buy products from sustainable agriculture, the following were listed: 37% of respondents (41) cited the high price of the product, 11% of respondents (12) do not trust the producer, 5% of respondents (6) do not trust the product, 5% of respondents (6) do not trust the product, 5% of respondents (6) have a problem with product availability in sales channels, 4% of respondents (4) have a low income, 2% of respondents (2) own their own conventional production, 4% of respondents (4) are engaged in sustainable production, and 32% of respondents (35) listed other reasons (Figure 17).

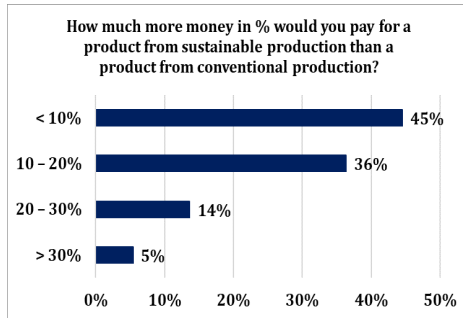
The fact that products from sustainable systems are more expensive than products from conventional production, when asked about the percentage higher amount that would be allocated for products from sustainable systems, as many as 45% of respondents (49) could allocate 10% more money, 36% of respondents (40) would allocate 10-20% more money, 14% of respondents (15) are able to allocate 20-30% more money, while 5% of respondents (6) are willing to spend more than 30% of money on sustainable products (Figure 18).

Figure 17. Please list the reasons why you do not buy products from sustainable production?



Source: Authors

Figure 18. How much more money in % would you pay for a product from sustainable production than a product from conventional production?

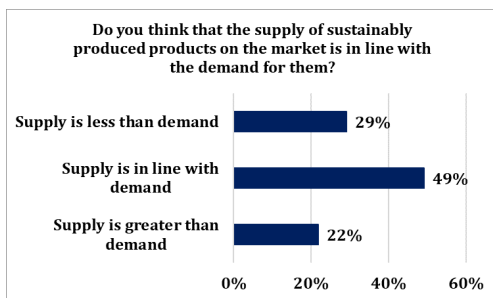


Source: Authors

Opinion regarding the supply and demand ratio of products from sustainable systems, 29% of respondents (32) believe that the supply is lower than the demand, 49% of respondents (54) believe that the supply is in line with the demand, and 22% of respondents (24) believe that the supply is higher than the demand (Figure 19).

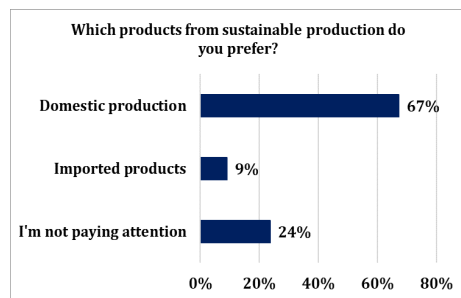
Regarding the preference for the origin of products from sustainable production, 67% of respondents (74) opt for domestically produced sustainable products, 9% of respondents (10) prefer imported products, while for 24% of respondents (26) it is not important (Figure 20).

Figure 19. Do you think that the supply of products from sustainable production on the market is in line with the demand for them?



Source: Authors

Figure 20. Which products from sustainable production do you prefer?



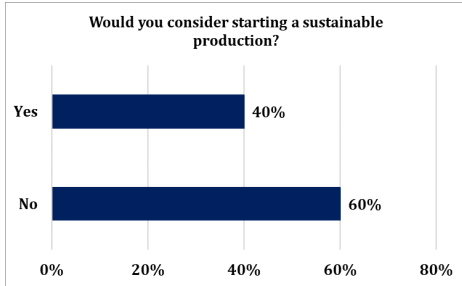
Source: Authors

When asked about considering the possibility of starting a sustainable production, 40% of respondents (44) were interested in starting a business, while 60% (66) had not considered this topic (Figure 21).

Regarding the motives for starting sustainable production, the largest number of respondents, 40% (44), opted for the motive of producing healthy food, 22% of

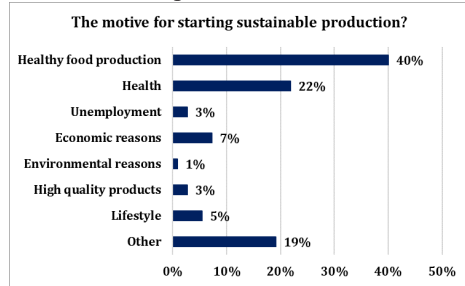
respondents (24) considered health, 3% of respondents (3) unemployment, 7% of respondents (8) cited economic reasons, 1% of respondents (1) considered it to be an environmental motive, 3% of respondents (3) cited high product quality as a motive, 5% of respondents (6) said it was a way of life, and 19% of respondents (21) believed that the motives were other (Figure 22).

Figure 21. Would you consider starting a sustainable production?



Source: Authors

Figure 22. Motive for starting sustainable production?

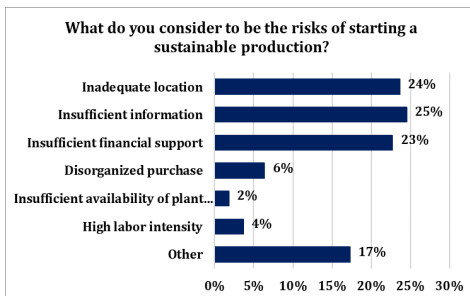


Source: Authors

Regarding the risks to starting sustainable production, 24% of respondents (26) cited inadequate location, 25% of respondents (27) considered it insufficient information, 23% of respondents (25) considered it lack of financial support, 6% of respondents (7) considered it disorganized purchasing, 2% of respondents (2) considered it insufficient availability of plant protection products, 4% of respondents (4) believe that the work intensity is high, while 17% of respondents (19) believe that the risks are other than those listed (Figure 23).

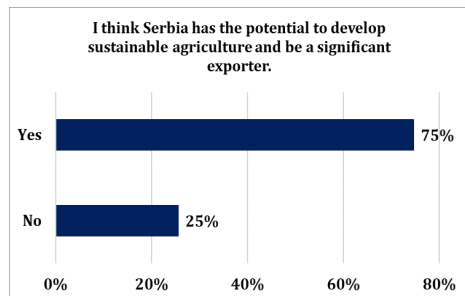
Of the 110 respondents, 75%, or 82 respondents, believe that the Republic of Serbia has the potential to develop sustainable agriculture and to become exporters on that basis, while 25% of respondents (28) have the opposite opinion (Figure 24).

Figure 23. What do you consider to be the risks of starting a sustainable production?



Source: Authors

Figure 24. I think that Serbia has the potential to develop sustainable agriculture and to become significant exporters.

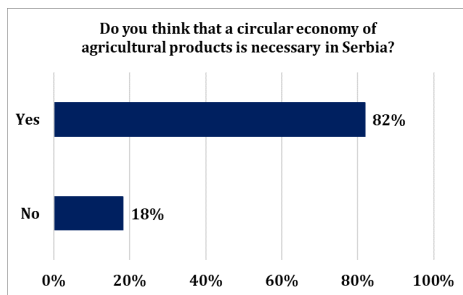


Source: Authors

When asked whether a circular economy of agricultural products is necessary in the Republic of Serbia, 82% of respondents (90) answered positively, and 18%, or 20 respondents, answered negatively (Figure 25).

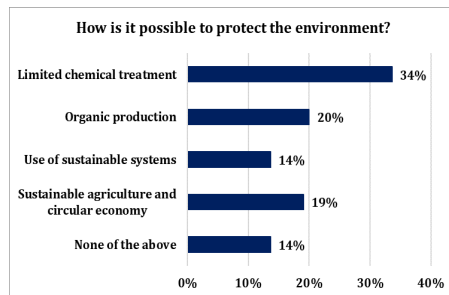
Regarding the way in which it is possible to protect the environment, 34% of respondents (37) are of the opinion that limited chemical treatment is necessary. 20% of respondents (22) opted for the introduction of organic production, 14% of respondents (15) for the use of sustainable systems, 19% of respondents (21) think that it is necessary to introduce sustainable agriculture and a circular economy, while 14% of respondents (15) believe that it is impossible to use any of the above (Figure 26).

Figure 25. Do you think that a circular economy of agricultural products is necessary?



Source: Authors

Figure 26. How, in your opinion, is it possible to protect the environment?



Source: Authors

Discussions

The results of the research, which mostly relate to young people living in suburban settlements and mixed-type households, are familiar with the concepts of sustainable agriculture and circular economy, which correlates with the research of Ignjatović et al., (2024c), who state that the development of sustainable systems, especially for rural areas, can be successfully realized by implementing e-learning through the E-Academy. According to Geza et al., (2021), young people living in rural areas most often opt for agricultural production due to meeting personal needs or the inability to find employment elsewhere.

It implies introducing support, innovation and ensuring accessible resources for stakeholders. A growing body of knowledge suggests that part of the solution to promoting youth participation in agriculture should include supportive policies and frameworks that promote capacity building (Chinsinga & Chasukwa, 2018). As a result, Gardiner & Goedhuys (2020) state that it is crucial to educate stakeholders with important skills, knowledge, and influence their ambition and motivation for sustainable development.

Mureithi (2023) explains that the necessary changes in environmental protection, sustainability and more complex systems are more accepted by younger farmers, and that in this regard they should be provided with all the necessary resources and

incentives. The same authors state that farmers, in general, are increasingly interested in some of the sustainable systems, such as organic, integral or precision agriculture. Bajagić and Ignjatović (2025) and Radosavljević et al. (2025) states that these systems are essential for the survival of humanity, given that sustainable development, through a circular economy and sustainable agriculture, directly impacts the production of healthy and safe food and environmental preservation for future generations.

Conclusions

Sustainable agriculture represents one of the possible perspectives of the market of agricultural products in Serbia. In addition, sustainable agriculture is considered both an ecological and an economic way to develop agriculture in order to apply the best agricultural practices, but also technologies that increase productivity and competitiveness on the market.

In order for production to be sustainable, within conventional agriculture, it is necessary to apply the rules of good agricultural practice: the correct use of synthetic pesticides with respect to the dose, time of application, as well as the method of application, but also the use of an alternative that is reflected in the application of biopesticides, as well as a more rational application, above all, of mineral and organic fertilizers. Fertilization should be based on the combined use of mineral and organic fertilizers, as it increases the carbon content of the soil. The recommendation is plowing of crop residues, green fertilization and growing intercrops, as well as a reduction in the number and intensity of operations when performing soil processing, depending on the type of soil and weather conditions.

Circular economy is an economic concept focused on reducing waste and pollution, producing and using materials and products, and restoring natural systems. It directly impacts rural areas through effective communication, empowers local communities and can inspire innovation and enterprise in rural areas, through sustainable ventures such as ecological agriculture, renewable energy production, recycling, green tourism. Research has shown that half of young people are familiar with the concepts of sustainable agriculture and circular economy. The largest number of respondents expressed an interest in sustainable agriculture, purchasing products or starting production, where the main motives are the health safety of food production and the preservation of the environment.

However, the biggest problems for the use of products from sustainable systems are the high price, lack of trust in the manufacturer or the unavailability of the product. On the other hand, the biggest problem for production is insufficient information and poor financial support. The authors conclude that in addition to the potential and resources of the state and those interested in starting a business, education on the implementation of the circular economy in sustainable agricultural systems, financial support and the availability of the necessary inputs for production are necessary.

Conflict of interests

The authors declare no conflict of interest.

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