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SUSTAINABLE AGRICULTURE CURRENT ISSUES IN KISTELEK (LAU1) DISTRICT OF THE SOUTHERN GREAT PLAIN REGION OF HUNGARY

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The Kistelek district (LAU1) is located in the Southern Great Plain region and is disadvantaged in terms of social and economic indicators. Agriculture and a declining population are the defining features of the region's economy. The target group of the questionnaire survey was small and medium-sized farmers operating in the district according to Standard Output (SO). The aim was to explore which natural factors influence their production activities, what strategic steps they take to mitigate these factors, and what their relationship is to organic farming, and whether they see a future for it in Hungary. The research was conducted between 2022 and 2023, during which 91 evaluable responses were received. The study confirms that climate change has a significant impact on the production results of farms, and that the farmers surveyed are not sufficiently prepared for this. The reasons for this include a lack of knowledge and training, as well as financial reasons, as their capital base is often weak, and therefore they show no real willingness to introduce adaptive and ecological practices.

Keywords: sustainability, climate change, organic farming, Kistelek district

Introduction

Sustainability has become one of the most important principles in agriculture today, and the effects of climate change have made this shift inevitable. The goal of sustainable development is to create an economic, social and environmental system that meets the needs of the present without compromising the potential of future generations (Bruntland Report, 1987; Fleisher, 2014). The Southern Great Plain is Hungary's warmest and driest region, and therefore the region most exposed to the negative effects of climate change. The main challenges are persistent water shortages, extreme temperatures, increased production risks, and the emergence of new pests and diseases. The future agricultural sustainability of the region depends largely on the development of irrigation, the construction of water retention systems, the use of climate-resistant varieties, and the spread of soil conservation farming methods (Izsák and Szentimrey, 2020; Láng et al. 2007; NÉS-2, 2018).

Sustainability requires a holistic approach that takes into account ecological integrity, social justice and economic viability (Varijakshapanicker et al., 2019; Leyva et al., 2021; Fleisher, 2014; Daly, 1994). According to Szlávik (2013), taking into account the spatial context is essential, as a precise knowledge of environmental, social and economic conditions is necessary for the local application of global objectives. The European Union's Common Agricultural Policy (CAP) has increasingly focused on sustainability in recent decades. According to the Hungarian National Chamber of Agriculture (NAK), the new agricultural policy model aims to serve environmental, economic and social objectives simultaneously (NAK AKG, 2021).

Sustainable agriculture aims to meet current food needs while maintaining the health of ecosystems and ensuring the well-being of rural communities (Zarei et al., 2021). It involves farming practices that support biodiversity, reduce pollution, and enhance food and income security (Hrabrin, 2016; Giger and Musselli, 2023; Fess and Benedito, 2018). Organic or biological farming is a complex farming system that operates under strict regulation and in an environmentally friendly manner. As defined by IFOAM (2014), it is a production system that prioritises the health of the soil, ecosystems and people, while avoiding the use of synthetic inputs. According to EU Regulation 2018/848, organic production aims to protect the environment and climate, preserve biodiversity and meet consumer needs. Konvalina (2016) stresses that this is not a return to the past, but a combination of traditional methods and modern science. According to Bálint (2006), organic farming not only reduces environmental damage by using environmentally friendly production technologies, but also creates jobs, contributing to the social and economic stability of rural areas. Panyor (2020) points out that organic farming aims to develop sustainable, diverse and profitable systems that provide healthy and valuable food for consumers. This requires the development of incentive support schemes that promote the spread of organic farming.

The proportion of land used for organic farming is still insignificant – 3.9% – within the total agricultural area in Hungary (KSH, 2020). However, there are no public, reliable statistics broken down by region that would show the proportion of organic farming in each region, including the Southern Great Plain region. This also indicates the uniqueness of the research, as it was one of the goals to explore this aspect. However, the results clearly indicate that, in addition to a systemic approach that integrates production, environmental, and social objectives, the practical implementation of sustainable agriculture also requires an open-minded attitude on the part of farmers. The innovative activity of local actors and their willingness to learn about and introduce adaptive or ecological practices are essential. At the same time, this requires the creation of a professionally and economically stimulating environment for farmers, which is not yet fully developed in Hungary. During research conducted in the Kistelek district, among other things, the extent to which natural conditions influence the sustainability of farms, the openness of farmers to organic farming that also supports sustainability, and their assessment of the related subsidy system were examined.

Materials and Methods

The sample area of the research covered agricultural estates in the Kistelek district. In the sampling strategy, general natural, social, and economic data on the selected sample area were first collected from state databases (e.g., KSH, TEIR), although these are not discussed in detail here. As a next step, an empirical research questionnaire survey was designed for the sample area, as questionnaires are a common tool for examining settlement processes and are also suitable for exploring data (e.g., openness to innovation, identification of sources of information, attitudes towards organic farming, etc.) that are not available from other data sources. Following the trial survey, the survey was conducted in several waves from September 2022 to December 2023 by students of the Faculty of Agriculture and Rural Development at the University of Szeged, after receiving preliminary professional training.

According to preliminary plans, visits would have been made to family farms that produce not only for self-sufficiency but also for the market. In terms of size, these farms fall into the small and medium categories according to the STÉ, which, in the authors' opinion, have an economic sensitivity that is relevant to the issues under consideration. There were no restrictions on the type of farming, so in addition to mixed farming, farms engaged solely in animal husbandry and crop production were also included. The selection process was difficult because the National Chamber of Agriculture did not release its database, citing personal rights (GDPR). Therefore, village agronomists in certain settlements in the Kistelek district were contacted, who were also unable to provide the authors with data, but who were partners in finding farmers who met the parameters and convincing them to answer the questions. At the suggestion of the village agronomists, the farmers were first contacted by email, and then, with the help of the village agronomists, a group of farmers was formed through personal contacts, which ultimately constituted the research sample. A total of 91 farms thus became the focus of the research.

The questionnaire consisted of 66 questions and was grouped around five broad themes in addition to demographic data:

1. questions related to the farm facilities,
2. questions related to the agricultural activity of the farm for market production,
3. questions related to the theme of digitalisation,
4. questions on the future of farm life,
5. questions related to sustainability and organic farming.

The present study focuses on Theme 5 which encompasses 21 related questions. The questions included both open-ended and closed-ended questions, with the latter including multiple-choice and intensity questions.

The main objectives of the study were as follows:

- T1: Investigation of the natural factors hampering the production of farmers in Kistelek district.
- T2: Examination of the ways of protection against natural factors hampering production among farmers in Kistelek district (irrigation, new production methods, cooperation, tenders, importance and role of subsidies).
- T3: Examination of the presence and importance of organic farming among farmers in Kistelek district.

In each commune, farmers who produce not only for subsistence but also for the market were contacted, based on data from village farmers. This was important because it is then not only considered a hobby but also a source of income. During the interviews with village farmers, an outline was drawn of those who were willing to provide data in a face-to-face interview. The reason for the farmers' reticence is their distrust of the institutions that constantly monitor them (NAK, NAV) and the length of the questionnaire. At the suggestion of the village farmers, the farmers were first contacted by e-mail, and then, with the help of the village farmers and their personal contacts, a group of farmers was formed, which finally constituted the research sample.

A total of 91 farms were included in the research. The interviews were carried out by students of the Faculty of Agriculture and Rural Development of the University of Szeged, after prior professional training.

The questionnaire data were entered into Excel, where they were cleaned and coded. The data were analyzed primarily using general descriptive statistical methods, focusing on the mean, frequency, and standard deviation. The results were also presented in diagrams using Excel.

There were several difficulties during the survey, despite the pilot survey. The most significant challenge was that most farmers were not open to personal contact or data sharing. The reason for this was their distrust of the institutions that constantly monitor them (NAK, NAV) and the length of the questionnaire. For some questions (especially those asking about economic activities and results), either more preparation was needed on the part of the farmers, or they did not want to answer them in detail, despite the anonymity (distrust). In some cases, it turned out that the interviewers were not sufficiently prepared or persistent, which also led to incomplete and inaccurate responses. Several farmers considered the questionnaire too long. This problem also existed during the trial run, and since it was well known that farmers were difficult to reach, the goal was to survey opinions on as many topics as possible.

Brief Description of the Study Area, the District of Kistelek

Kistelek district is located in the Southern Great Plain region, in Csongrád-Csanád County (Figure 1). It consists of six settlements: Baks, Balástya, Csengele, Kistelek, Ópusztaszer, Pusztaszer. According to the Government Decree 290/2014 (26. XI.), this district is classified as a beneficiary district and is the 41st most deprived district in Hungary according to the complex development index.

The district is experiencing demographic chellanges due to an ageing population and a decreasing number of births (Kovács et al., 2021). The district of Kistelek is an underdeveloped area in terms of industry, and its economic characteristics are mainly determined by agriculture (Kovács et al., 2024; Szamosköziné et al., 2024). Traditionally, the dominant sectors in the area are arable farming and fruit and vegetable production. Agriculture uses about 75% of the land registered at district level. The area is in a temperate climate zone, but is prone to extreme weather events, such as daily peak temperatures exceeding 35°C in summer and prolonged periods of drought (District Equal Opportunities Programme, 2015; HungaroMet, 2021).

The district of Kistelek can be divided into two parts based on soil conditions. About one-fifth of the area of the district is located on the floodplain along the Tisza River. This area is dominated by meadow soils formed on loam and clay with very extreme water management (very poor water absorption and high water holding capacity). The majority of the district is located on the eastern slope of the so-called sand hills between the Danube and the Tisza. This area is characterised by drifting sand, loamy sand and the alluvial soils that have developed on them, which are exposed to drought, have a low organic matter content, are very good absorbers of water and have a low water holding capacity. It is mainly the sandy loam areas that would require soil recharge and irrigation, but these areas are located far from

Figure 1 Location of the district of Kistelek, 2025
Source: KSH (2025)

Table 1 Types of weather risks among surveyed farmers, db ($n = 86$ persons)

Weather risks	Mention frequency
Storms, gale force winds	66
Dryness, drought	43
Ice, hail	33
Early frost, frost damage	21
High, prolonged heat	5
Flooding	4
Heat wave	2
Lightning	1
Freezing Rain	1

Source: own edited

Table 2 Suggestions for solutions to weather risks, number of respondents ($n = 42$)

Suggested solutions	Mention frequency
Irrigation, irrigation extension	16
Don't plan anything yet or think there is no solution	10
Irrigation against frost	3
Building a plastic tunnel and greenhouse	3
Afforestation, tree planting	3
Mulching	2
Tarpaulin mulch	2
Ice protection system	2
Use of weather-tolerant plants	1

Source: own edited

the district's only surface irrigation water source, the Tisza River. The whole area is one of the most drought-prone areas in Hungary. The area has an annual mean temperature of 11.5 °C and is one of the hot and dry regions of Hungary (MTA ATK TAKI, 2014; HungaroMet, 2021).

Results and Discussion

Weather Risks and Adaptation Strategies

According to Felkai and Varga (2010), global climate change is the most significant risk factor for agriculture. Experts disagree on the extent to which climate change contributes to observed climatic changes (Kovács et al., 2009). What is certain is that extreme weather events are becoming more frequent and more intense. This is confirmed by the responses of farmers in the Kistelek district to the question about the weather risks they face (Table 1).

Among the farmers surveyed, storms and gale-force winds were the most frequently mentioned. This was followed by drought and aridity, as well as ice and hail, as the most significant weather risk factors. Early frost and frost damage were also a major concern for respondents during the period under review, with persistent heat, inland water, heat waves and lightning damage also being mentioned. These findings indicate that the surveyed farmers surveyed are experiencing the effects of climate change in the Kistelek district.

Farmers interviewed provided suggestions for solutions to weather-related risks that they either already use or would like to use in the future (Table 2). They typically consider technological and infrastructural solutions (e.g., expanding irrigation, installing ice removal systems, constructing plastic greenhouses), and some agroecological responses are also present (e.g., mulching, afforestation, tree planting, use of heat-tolerant varieties). In the year 2022 – the period of the research – there were also several months of insufficient rainfall, which caused severe damage to Hungarian agriculture and to farmers in the district of Kistelek (Szentes, 2023). The area included in the research is also included in the areas at risk of drought according to the NAK AKG (2021), which will be exacerbated by the climate change process.

Irrigation and Water Management

The majority of respondents consider irrigation and improvement of the existing irrigation system as the solution to drought and aridity (Table 2). Irrigation was also highlighted by

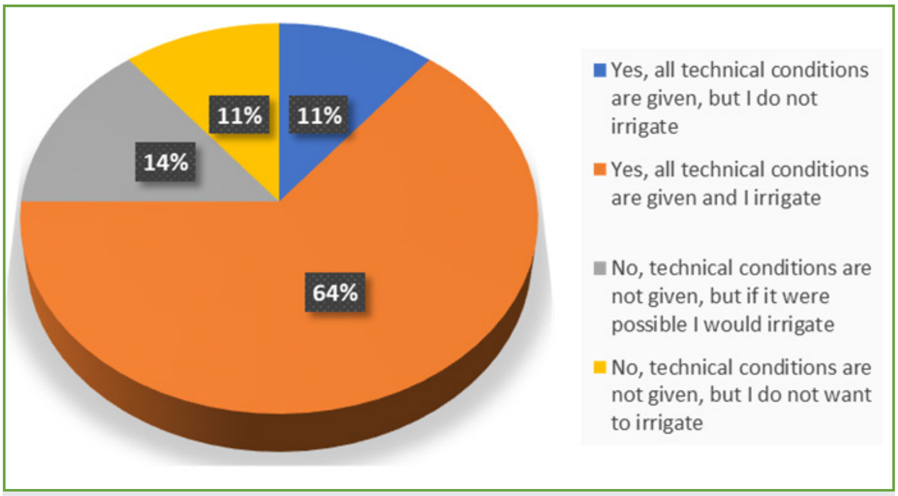

Figure 2 The issue of irrigation in farms in Kistelek district, % (*n* = 91)
Source: own edited

farmers as a solution to frost, but they also considered the construction of plastic tunnels and greenhouses, afforestation and tree planting, and covering with row covers as solutions. To reduce weather risks, they also suggested reduced tillage, the use of windbreaks, changing crop structure, rainwater harvesting and increasing the farm. This may indicate that farmers are not adequately prepared for climate change and the associated extreme weather conditions, or that they lack the necessary knowledge and information to respond effectively. This may indicate that farmers are not prepared for climate change and the extreme weather conditions that this will bring, or it may also indicate that they lack the knowledge and information.

Water management is an important part of the ecological and agri-environmental commitments. The requirements specify when mechanical work is permitted on waterlogged soil, prohibit the irrigation of grassland, and also ban the drainage of temporary standing water. At the same time, irrigation is becoming increasingly necessary in areas covered with useful crops because of longer periods without water and higher average daily temperatures. The questionnaire also identified the needs for improving irrigation (Figure 2).

Of the 91 respondents, 84 answered the question on the possibility of irrigation. As shown in the distribution chart, 64% of the respondents have all the technical conditions and irrigate, while 25% (21 people) cannot irrigate. The percentage of those who could irrigate but do not irrigate is 11% (9 persons). This question is nuanced by the fact that at the time of the survey there was a major controversy about the legalisation of unauthorised wells. A major press campaign encouraged owners to report the large number of wells in the sandflat areas, but they preferred to continue to conceal the existence of their wells in order to avoid public charges. The need for irrigation is also reflected in the fact that irrigation and irrigation extension were the most frequently mentioned economic development activities, with 37 respondents.

By-product Management Among Farmers Surveyed

The way crop waste and manure are treated is not only important for subsidies but also for replenishing soil nutrients and improving soil structure (e.g. mulching). Among the respondents, some were only involved in crop production, others only in livestock production, but there were also mixed farms, so the question on by-product management had to be answered based on the main farming activity, and accordingly differences in the number of respondents (*n*) are observed. The responses obtained are presented in a distribution diagram (Figure 3).

87 out of 91 respondents undertake soil replenishment as a way of helping the area to be resilient in such extreme weather conditions. The sandy soils in the area are among the most rapidly losing organic and mineral matter. Because of the depletion of soil fertility, soil replenishment is a key factor in maintaining farming. When asked about manure management, 87 respondents said that most of them use it and 38 said that it is important to promote natural cycles. The second most common practice was outdoor storage (23 respondents), while the third was not storing it at all (8 respondents). It is important for the protection of soil and groundwater that progress is made in this area in the future. In the case of vegetable waste, 82 respondents indicated the type of treatment: composting was the most common (47), followed by recovery (23). The other responses were minor in comparison. For example, the answer "not dealt with" was given by 3 people, while 5 people indicated outdoor storage. Of the respondents, 33 use organic fertilisers, 5 use fertilisers, while 48 think that both are necessary. This shows that traditional and modern production do not replace but complement each other, at least in practice.

Cooperation and Social Capital

Sustainable agriculture involves meeting economic and social needs. It is useless to practice organic farming if it is not financially worthwhile. In Hungary, for example, the cost

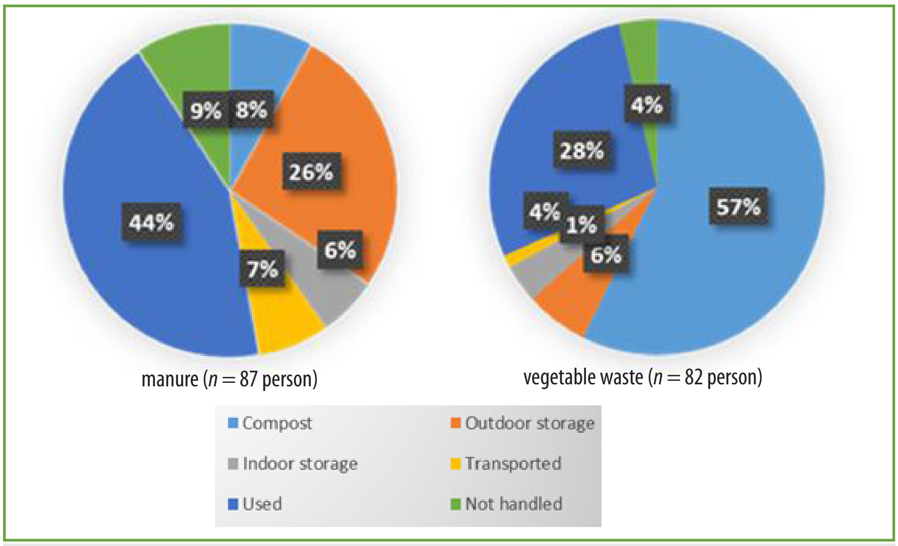

Figure 3 By-product treatment within each subcategory as a percentage (%)
Source: own edited

of complying with the subsidy conditions may be higher than the subsidy itself. But there are also examples of people who are not able to apply organic farming to their products, so that it results in additional costs and energy losses. Social needs are primarily about information flow, leading by example, a sense of belonging, community building, which can be an advantage for sustainability in the future. All these economic and social aspects can be facilitated through cooperation. The additional objectives are well summarised in an earlier study below.

The objectives of a producer group can be:

- flexibility to adapt production to market needs,
- increasing bargaining power,
- increasing added value,
- economies of scale in sales and purchasing,
- joint marketing of goods,
- establishing common standards for the transfer of information,
- expanding and developing marketing and entrepreneurial skills for distribution, and
- the creation of uniform quality (Szamosköziné, 2019).

In the future, the role of cooperation between farmers to achieve sustainability will become increasingly important, as it is through cooperation that the risks to agriculture can be mitigated. The survey also addressed this aspect and 25 out of 91 respondents answered. 22 respondents answered that they are members of some kind of producer cooperation outside the National Chamber of Agriculture (mandatory under Act 126 of 2012 of the National Chamber of Agriculture). Examples mentioned include the Pig Cooperative, the Agricultural Cooperative, the Gardeners' Club, the Poultry Product Council, the OMME, the Hungarian Tarka Association, the Hungarian Sheep and Goat Breeders' Association and Vegama, without claiming to be exhaustive. Experiences and associations regarding the cooperation were further assessed. Various statements were formulated and had to be rated on a scale of 1 to 5 according to how much they agreed with them. The result of this is shown in Table 3.

Table 3 shows that 9 out of 25 respondents were indifferent and 5 disagreed with the possibility of an increase in economic benefits indicated in point "a". This implies that one of the most important points, economic benefit, may not be a given in the presence of cooperation. This may be due to a distrust of cooperation that stems from the socialist era. In point 'b' on membership outcomes, the majority of respondents (10) said they 'tend to agree', i.e. they are basically satisfied with the results of cooperatives or other cooperative activities. While the first 2 statements related to performance and satisfaction, the other 2 related to group cohesion. For the latter, statements 'c' and 'd', respondents fully agree that they feel a sense of belonging to the community and a commitment to take cooperation to a higher level, which is encouraging for the future. This may also provide some help and motivation for those who are not yet members.

Of those who are not yet members (66 people), only a small proportion, of 25% (17 people), said they would like to join a collaborative. Most of these would join a relevant producer marketing organisation.

The main reasons why the farmers interviewed are reluctant to join:

- lack of trust,
- negative experiences,
- not necessary,
- not profitable,
- no cooperation they would like to join,
- potential for financial loss,
- the economy is too small for cooperation,
- expensive,
- unpromising,
- lack of interest and
- has been a member.

Table 3 Measures of performance, satisfaction and group cohesion among farmers in Kistelek, % (*n* = 25)

Performance and satisfaction				
a) I consider that cooperative/collabrotive membership has resulted in increased economic benefits for my business				
strongly disagree	rather disagree	indifferent for me	rather agree	strongly agree
4 persons	1 persons	9 persons	6 persons	5 persons
most are indifferent to this claim				
b) Overall, I am satisfied with the results achieved through cooperative/ collabrotive membership				
strongly disagree	rather disagree	indifferent for me	rather agree	strongly agree
2 persons	2 persons	7 persons	10 persons	4 persons
most are rather satisfied with the results of cooperation so far				
Group cohesion				
c) I feel that being a member of a cooperative/co-operative not only gives me financial benefits, but also means belonging to a community				
strongly disagree	rather disagree	indifferent for me	rather agree	strongly agree
2 persons	4 persons	5 persons	5 persons	9 persons
most people fully agree that membership not only gives them financial benefits, but also a sense of belonging to a community				
d) I am committed to raising the level of cooperation and collaboration between members				
strongly disagree	rather disagree	indifferent for me	rather agree	strongly agree
0 persons	3 persons	7 persons	6 persons	9 persons
most of them fully agree that they are committed to taking cooperation to a higher level, so they want it to continue and to be stronger				

Source: own edited

Farmers' Attitude Toward Organic Farming

Nowadays, organic farming, and with it organic products, are gaining more and more prominence due to their positive effects on health, their environmental benefits and, in a broader sense, their strengthening of the relationship between nature and humans (Nezdei, 2018). Organic farming therefore offers significant sustainability benefits, including increased biodiversity and improved soil quality (Panyor, 2020). As a result, organic farming is playing an increasingly important role in agriculture. In numerical terms, between 2005 and 2018, the amount of agricultural land under organic farming worldwide increased 2.4-fold to 71.5 million hectares. The rate of increase of these areas varies from continent to continent. In Europe, the cradle of the organic economy, organic area has increased by a factor of 2.2 to 15.6 million hectares over the period. In 2018, the share of organic farming in Hungary was 3.9%, ranking 21st among EU Member States (KSH, 2020).

The research investigated the openness of farmers in Kistelek district towards organic farming, what they think about its advantages and disadvantages (Figure 4).

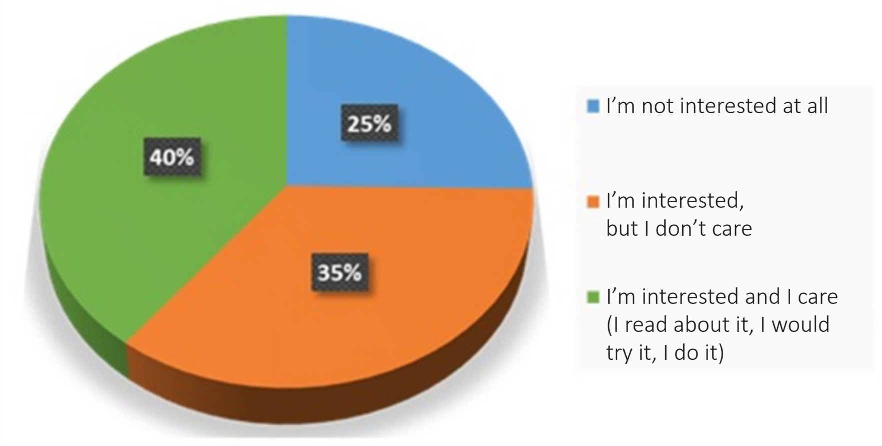

Figure 4 Surveyed farmers' openness to organic farming, % ($n = 91$)
Source: own edited

25% of the farmers surveyed (23) are not at all interested in organic farming. 40% (36 people) are interested and informed about it, while 35% (32 people) are interested but not currently involved at any level. So 75% of the respondents do not reject organic farming. The next question addressed whether they are currently engaged in organic farming or would consider switching to it: 12% of farmers are engaged in it (11 people), 21% (19 people) are thinking about possibly switching to it, while 67% (61 people) of respondents are not thinking about switching to organic farming. The farmers surveyed gave reasons for their answers, which were very diverse. Among the reasons cited were a lack of demand for organic products, strict rules that make production difficult, high risks, difficulties in making the transition, labour shortages in agriculture, lack of expertise and financial capital, and not always favourable territorial conditions.

The next questions were on the advantages and disadvantages of organic farming, where farmers were asked to rate the different factors on a scale of 1 to 5 (Table 4).

According to respondents, the biggest benefit of organic farming is the production of healthy food. The biggest benefit of this type of farming was the positive impact on flora and fauna. In addition, the hope of financial benefits, higher selling prices and EU subsidies were also identified as significant benefits.

The main disadvantages of the transition to organic farming were the low number of seasonal workers and the high salary requirements. The lack of weather and chemical control of pests was also perceived as a significant disadvantage. Variable prices from year to year and lack of solvent demand were perceived as less of a constraint to continuing organic farming (Table 5).

Overall, out of 91 respondents, 41 think that there is a future for organic farming in our country, 26 think "maybe", and 24 think "no, there is no future". Respondents believe that organic farming will be important in the future because it contributes to sustainability and the protection of the environment, the production of healthier food, and that national and international legislation will require changes in this direction. Those who believe that it is not worth it argued that it is not financially viable because it is costly and difficult to switch to this production method, and that it is difficult to find a solvent demand because consumers are not yet concerned with nutritional value. They also mentioned labour shortages in agriculture, weather, administration and generational difficulties.

The farmers interviewed made suggestions to encourage a shift to organic farming. 36 respondents thought that subsidies might be the solution, 9 thought that it was not

Table 4 Evaluation of the factors that contribute to the benefits of organic farming, main

	1	2	3	4	5
a) Higher selling price ($n = 78$)	30	8	17	5	18
b) Healthier ($n = 91$)	51	13	11	4	12
c) Improves soil fertility ($n = 78$)	23	14	18	7	16
d) Beneficial to flora and fauna ($n = 82$)	34	14	14	9	11
e) Supported by the European Union ($n = 79$)	29	10	19	7	14

Source: own edited
1 – most benefit, 5 – least benefit

Table 5 Ranking of factors that are disadvantages of organic farming, main

	1	2	3	4	5
a) Soil conditions ($n = 81$)	25	12	26	3	15
b) Weather ($n = 81$)	38	10	21	3	9
c) Lack of chemical control of pests ($n = 82$)	34	18	17	2	11
d) Variable prices from year to year ($n = 78$)	18	15	28	6	11
e) Low number of seasonal workers, high wage demand ($n = 79$)	40	11	12	4	12
f) Lack of affordable demand ($n = 78$)	24	13	23	5	13

Source: own edited
1 – most disadvantage; 5 – least disadvantage

the producers who should be encouraged but rather the consumers should be motivated to change their attitude. Suggestions included education and information for farmers, as well as technical advice, helping to get products to market and developing partnerships. 4 farmers felt that it was not possible to encourage people to switch to organic farming. It is important to note that organic farming involves a number of economic risks, several of which were mentioned by farmers, such as: the costs of the transition period, the possibility of higher manual labor requirements, and higher operating costs. Changing climatic conditions can further increase crop volatility in organic farming. Demand for organic products is growing, but the market is still price-sensitive. In addition, administrative burdens may increase and specialised knowledge may be required, which is time-consuming and costly. In addition to economic risks, organic farming offers a number of advantages. The most important of these is its contribution to environmental protection, for example by improving soil quality, which can lead to more sustainable crop yields in the long term. Input costs may decrease through the reduction or complete elimination of chemical use and fertilisers. It is also important to mention the social aspect, as these products are viewed more positively by consumers, which gives them a competitive advantage in the market in the long term. The EU also considers these farming practices to be an important task and therefore seeks to promote more environmentally friendly production in the form of subsidies. A previous call for proposals specifically aimed at promoting organic farming was "Support for Organic Farming." Other such support programs include the AKG and the Agro-ecological Program (AÖP) (NAK, 2021).

It was mentioned earlier that subsidies can be a major motivating factor, so this was also examined in the research. Of the farmers interviewed, 49 had received funding under agricultural or other grant scheme. The applications were typically for renovation or energy modernisation of buildings. In addition, the purchase of machinery and equipment and the improvement of premises were also common. When asked whether new grants would motivate them to carry out future improvements, 52 respondents answered in the affirmative, of which 15 farmers had not applied before. Of the 49, 37 would apply again if the opportunity arose. Among those who would like to make improvements in the future, the most common is the purchase of machinery (19 people). In addition to the purchase of machinery, modernisation, expansion and the construction of new (storage) buildings were typical. Those who have not yet applied typically aim to expand or modernize their machinery, or to make improvements in the livestock sector. AKG support in Hungary is a form of direct support for the development of ecologically sound forms of farming. However, no application for this was received from the respondents. One reason for this, as mentioned earlier, is that the cost of complying with the conditions of the AKG (e.g. significant administrative burden) may be higher than the amount of support itself, so this risk does not make this form of support attractive for farmers in all cases. Another reason may be that most of the farmers interviewed need support for more "traditional", "familiar" development purposes. This may indicate a low intensity of openness to innovations, but it may also mean that in order to move forward and develop, it is first necessary to improve the quality of infrastructure and equipment to Western standards.

Basically, farmers want to make a living from production, which requires profitable farming in the long term, including a profitable purchase price. If production prices do not provide sufficient profit, farmers are compelled to apply for grants to supplement their income, even when they do not fully agree with the conditions.

Conclusions

One of the most important questions is how to reduce weather risks in agriculture. Questionnaires with farmers reveal that most would respond to drought and dry conditions by irrigating or improving their irrigation systems, while others would adopt new crops, collect rainwater, or plant trees. Regős (2012) compiled a list of available methods to reduce risks from agricultural production, which included: obtaining more information, such as weather forecasts; consulting experts; and developing vertical integration. Horizontal integration among farmers can play a significant role in achieving both. Szabó (2013) describes how cooperatives become a social public good. In fact, the cooperative principles serve the social good, whereby the protection of the environment appears alongside material goods, as it is becoming more and more important nowadays. Among the suggestions made by farmers to encourage organic farming were education, the provision of information material to farmers, as well as advisory services and assistance in getting products to market, all of which could play an important role in the development of a cooperative. It is also important to note that farmers are not prepared for climate change and the extreme weather conditions that this brings. There are several reasons for this. Firstly, some farmers lack knowledge, training and information. This problem can also be solved by cooperating and working together. Of the 91 farmers surveyed, 22 said that they were members of some kind of producer cooperation, which seems to be a small number. Climate change and its consequences have become a strategic priority, both domestically and internationally. To this end, it would be important in the future to develop more targeted financial incentives and support systems, strengthen knowledge transfer, training, and professional advice, and make them easily accessible to farmers. Further proposals included mapping climate risks at the level of smaller territorial units and integrating this into decision-making, as well as strengthening short food supply chains (SFCs).

The survey showed that the majority of farmers would like to improve their farm, but in many cases they do not have the financial resources or are not aware of the available funding opportunities. The various grants and tenders and their proper use would give farmers the opportunity to make improvements that would help them adapt to weather risks and contribute to sustainable farming. Such tenders could include, for example, the purchase of precision machinery and equipment or the efficient installation of irrigation systems. In general, the solutions indicated by farmers that they would be happy to choose (irrigation, anti-frost irrigation, greenhouse construction, afforestation, etc.) are in line with the most important objectives of the Common Agricultural Policy for the period 2023–2027. The new support system considers it important that agricultural production be a profitable and socially recognized activity. In the case of the new CAP, which has a budget of nearly HUF 4,500 billion, environmental and climate policy objectives are of paramount importance. In addition, the program (NAK) targets smaller farms, which means that funds can be allocated to the plans of the farmers visited, thus facilitating implementation.

For family farms, the existence of tendering and support schemes, financial incentives to promote development is essential, because it enables them to grow and develop, which is a guarantee of both competitiveness and long-term survival. Organic farming would be promoted by increasing the number of people in society who can afford organic products and who are less price-sensitive, because this would stabilise demand for organic products and increase the range of products available.

It is important to note that the available resources are four times higher than in the previous cycle, and it is unique in the entire European Union that the national supplementary resources have increased to 80% compared to 17% in the previous cycle. Pillar II of the CAP covers economic development interventions. This represents 51% of the total resources and also includes the development of the food sector, which is also important for farmers due to its higher added value and higher profitability. The EU requires that 36% of the resources be spent on green measures (NAK, 2021). The new CAP and most new agricultural programs (e.g., the Digital Agricultural Strategy) promote the implementation of farmers' plans and provide resources to support effective developments, while the NAK also offers detailed information through its network of village agronomists for the sharing and interpretation of information. It is therefore worth encouraging farmers to ask questions and apply for funding, as they can make significant progress in the current cycle.

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