

SUPPORTED FOR SUSTAINABILITY: AES AND AEP OPPORTUNITIES FOR FARMERS

Anita SOÓS¹ – Béla LUKÁCS²

¹ Magyar Agrár- és Élettudományi Egyetem, 2100 Gödöllő, Páter Károly utca 1., e-mail: soos.anitaev@gmail.com

² Nyíregyházi Egyetem Nyelv- és Irodalomtudományi Intézet, 4400 Nyíregyháza, Sóstói út 31/b., lukacs.bela@nye.hu
<https://doi.org/10.71066/FTTMK.1.02>

Introduction

The Agri-Environment Scheme (AES in English, *Agrár-környezetgazdálkodási Program, AKG* in Hungarian) and the Agro-Ecological Programme (AEP in English, *Agro-Ökológiai Program, AÖP* in Hungarian) play a key role in promoting sustainable agriculture. These subsidy schemes specifically help farmers to adopt environmentally friendly and sustainable production methods, while ensuring the long-term fertility of farmland and the preservation of biodiversity. One of the basic principles of sustainable agriculture is that production should not only be economically viable in the short term, but should also preserve natural resources in the long term. Agriculture is one of the sectors with the greatest impact on the environment, as it directly affects soil quality, water management, and biodiversity. Intensive farming methods often lead to excessive use of chemicals, soil erosion, and water pollution, which threaten the long-term sustainability of food production.

The aim of sustainable agriculture is to use methods that minimize environmental impact while ensuring adequate production levels and profitability for farmers. To this end, programmes such as the Agri-Environmental Scheme and the Agro-Ecological Programme play an increasingly important role, providing financial incentives to help farmers introduce sustainable practices.

The AES and AEP programmes not only provide financial support, but also contribute to the long-term spread of sustainable agricultural practices and environmental protection.

Literature review

Agriculture plays a fundamental role in meeting humanity's food and fiber needs. However, modern agricultural practices, while increasing productivity, have often brought with them significant environmental and social challenges, for example the spread of invasive plant species and the ecological and social risks associated with them (Csecserits et al., 2018). As a result, the concept of sustainable agriculture has gained increasing prominence in scientific discourse and policy. This concept aims at the long-term sustainability of production, taking into account environmental, economic, and social dimensions (Makszim, 2023; Nagy, 2007). There is a close and reciprocal relationship between sustainability and social processes. Sustainability can only be achieved if social aspects such as justice, participation, education, and social security are also taken into account. Social processes, including consumer habits and lifestyle choices, shape the possibilities for sustainability, while sustainability efforts also have an impact on social structures (Csabai et al., 2022; Makszim, 2022; Csabai et al., 2023).

There is no single, universally accepted definition of sustainable agriculture, as it is a complex and dynamic system that encompasses environmental, economic, and social criteria. According to Schaller (1993), sustainable agriculture is a “popular term for an environmentally sound, productive, economically viable, and socially desirable agriculture.” This approach emphasizes that sustainability is not just a set of technical solutions, but also a way of thinking and a number of farming practices aimed at ensuring long-term viability (Soós-Makszim 2024).

Pretty (2007) highlights that concerns about the sustainability of agricultural systems focus on the need to develop technologies and practices that do not damage environmental goods and services, are accessible and efficient for farmers, and improve food productivity. This includes integrating biological and ecological processes into food production, minimizing non-renewable inputs, and making a productive use of farmers' knowledge and skills.

Dimensions of sustainability

The concept of sustainable agriculture is traditionally based on three main dimensions, often referred to as the “triple pillar”: environmental, economic, and social sustainability (Makszim et al., 2024).

Environmental sustainability: This dimension focuses on the conservation and protection of natural resources. Its objectives include maintaining soil fertility, managing water resources efficiently, preserving biodiversity, minimizing air and water pollution, and adapting to and mitigating climate change. This includes practices such as soil protection, precision farming, integrated pest management, and organic matter management.

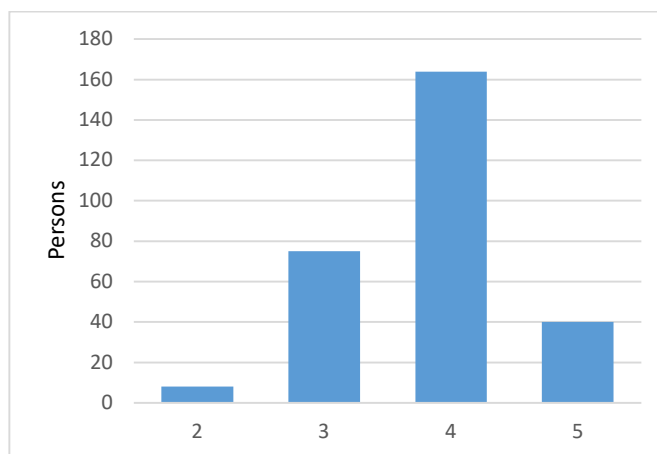


Figure 1. Commitment to Sustainability in Agriculture

Economic sustainability: This dimension ensures the long-term economic viability of agricultural activity. Its aim is to maintain the profitability of production, the stability of farmers' incomes and the financial flexibility of agricultural holdings. It is important that sustainable practices should not lead to a significant reduction of income, but contribute to the long-term stability and competitiveness of farms. Sustainability also has a significant and increasingly decisive impact on regional development, as it is no longer sufficient to consider only economic aspects when one develops regions — environmental and social factors also play a central role (Makszim, 2021).

Social sustainability: This dimension focuses on the social justice and fairness of agricultural systems. It encompasses the well-being of rural communities, job security, food safety and quality, as well as consumer health (Moravec, 2022). The goal of social sustainability is that agriculture should contribute to the development and well-being of society as a whole, taking into account intergenerational equity (Moravec and Kovács, 2025). These dimensions together form a holistic approach to sustainable agriculture, which is essential for meeting the food needs of future generations without jeopardizing natural resources or social well-being.

Agri-environment schemes and agro-ecological approaches are key to developing sustainable agriculture (Grónás et al., 2006; Ujj et al., 2022). In recent decades, we have witnessed a phenomenon that affects not only agricultural production but all inhabitants of the Earth: climate change (Apáti and Kosztyuné, 2025; Vágvölgyi and Kosztyuné, 2025). Climate change and environmental challenges necessitate a transformation of agricultural practices, which requires significant resources (Száltekei et al., 2024). Financing sustainable investments and green financial solutions are becoming increasingly important in the agricultural sector (Pókos and Kemény, 2023). The European Union's Common Agricultural Policy (CAP) and the EU taxonomy impose new environmental requirements on farmers (Lámfalusi et al., 2023). A

complex interpretation of sustainability and the integration of environmental, social and governance (ESG) considerations are necessary for agricultural enterprises (Pupos and Nábrádi, 2022; Lakatos, 2023). The objectives of the European Green Deal pose significant challenges for the Hungarian agricultural economy (Takácsné Gy. K., 2022).

AES: Agri-Environment Scheme

AES is a form of support that requires a long-term commitment, in which farmers undertake to use sustainable land use and soil renewal techniques. The objectives of AES are:

- To enforce environmental considerations in agricultural production
- To improve soil and water quality through sustainable farming methods
- To preserve biodiversity through maintaining nature conservation areas

To participate in the scheme, farmers must agree to certain requirements, such as:

- Keeping an electronic farm log.
- Participating in training courses on sustainable farming methods.
- Compliance with thematic requirements, such as soil renewal farming or maintaining nature conservation areas.

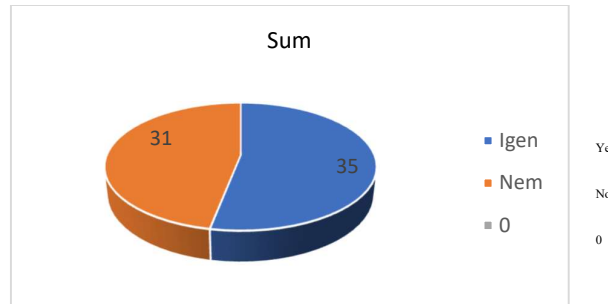


Figure 2. The Participants in AES. Source: My Data

AEP: Agro-Ecological Programme

The AEP is a more flexible, one-year commitment form of support in which farmers can voluntarily choose sustainable agricultural practices. The objectives of the AEP are:

- To encourage environmentally- and climate-conscious farming
- To improve the condition and water management of soil
- To promote more sustainable use of plant protection products

To participate in the programme, farmers must choose practices worth at least two points in each crop category.

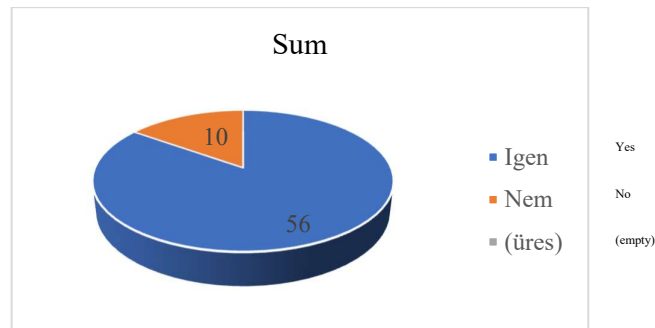


Figure 3. The Participants in AEP. Source: My Data

Materials and methodology

Data collection

Collecting data through a large-sample questionnaire, we used a quantitative method in our research. The goal of the data collection was to get a comprehensive picture of the effects of the agricultural programmes on the farmers. The questionnaire contained structured questions relating to farming practices, economic results, and participation in the programme. The sample was divided into two groups: farmers participating in the programme and farmers outside the programme (serving as a control group).

Data analysis

The data was processed and analyzed using Microsoft Excel. The purpose of the comparative analysis was to explore the impact of participation in the programme on farming results.

Results and their evaluation

Supporting sustainability in agriculture is of key importance in terms of food security, protecting environmental resources, and increasing biodiversity. The concept of sustainable agriculture combines social, economic and environmental aspects, and the European Union's Common Agricultural Policy (CAP) also gives priority to these objectives within the framework of agricultural policy. The agro-ecological approach is particularly important, as it aims to apply the ecological principles of farming, thereby supporting environmentally friendly and sustainable practices (Horváth, 2024).

In the EU, the CAP supports the training and advising of farmers and the application of sustainable agricultural practices, while taking into account the dual requirement of economic and environmental performance. Such policies also strengthen the competitiveness of farms (Dorfmann, 2018).

Also important is a multidisciplinary, systems theory-based approach that combines ecological, economic, and social dimensions, promoting long-term sustainable agricultural production (Száltelegi et al., 2024).

Thus, support for the sustainability of agriculture is achieved through a complex set of devices that includes the integrated management of environmental protection, economic stability, and social justice, helping the agri-food system to be efficient and adaptable to the challenges of the 21st century (Horváth, 2024).

Conclusions

Farmers face a number of challenges when adopting sustainable agricultural practices. Among these, taking high costs involved are particularly significant, as investments in sustainable technologies and equipment require considerable financial outlay, and communicating sustainability and educating consumers can also be expensive. In addition, implementing sustainable farming involves planning and development difficulties that require special skills and time, which not all farmers can provide.

Another challenge is the uncertainty of the regulatory environment, as sustainability requirements change frequently and various legal, hygiene, or public procurement restrictions hinder the flexible operation of local food sales. When implementing sustainability, there is often a lack of efficient dialogue and cooperation between different interest groups, actors, and institutions, which makes it difficult to implement successful sustainability programmes (Makszim and Soós, 2025).

Summary

The Agri-Environmental Scheme (AES) and the Agro-Ecological Programme (AEP) play a key role in promoting sustainable agriculture in Hungary. The aim of these support schemes is to encourage farmers to use environmentally friendly and resource-efficient production methods,

thereby contributing to the preservation of soil fertility, the maintenance of biodiversity and the protection of water resources. The essence of sustainable agriculture is that economic production should remain in harmony with the natural environment in the long term, minimizing harmful environmental impacts such as excessive use of chemicals, soil erosion, or water pollution. The AES and AEP not only provide financial support, but also promote the widespread adoption of sustainable practices, thereby contributing to reducing the ecological footprint of the agricultural sector and laying the foundations for long-term food security.

Keywords: sustainability, AES, AEP, support, farmers

Acknowledgements

We express our gratitude, first and foremost, to the Institute of Technology and Agricultural Sciences of the University of Nyíregyháza for giving us the opportunity to publish our article. We also say thanks to the farmers, who welcomed us willingly and answered our questions. During our conversations, in addition to the answers related to the topic, we received a great deal of thought-provoking information from them, which we consider to be both useful and interesting.

Literature

- Agrárközösség. (2020). Fenntartható mezőgazdaság, mi is az? https://agrarkozosseg.hu/fenntarthato-mezogazdasag-mi-is-az/?gad_source=1&gad_campaignid=22792773503&gbraid=0AAAAApenoJG18quO7ipRoPNQW6rb2ls0&gclid=Cj0KCQjwMHEBhC-ARIsABua5iTT5iA_yQXhSJYs901pP2GwYyo44LbEERNf19oJ76QOpqKTpHzclgaAkNfEALw_wcB (letöltés ideje: 2025.08.04.)
- Apáti, Zs. – Kosztyuné, K. E. (2025): A mezőgazdasági szaktanácsadás értéke a fenntartható fejlődésben MEZŐGAZDASÁGI TECHNIKA: 5 pp. 2-6. , 5 p.
- Csabai, J. – Szabó, B. –Kosztyuné Krajnyák, E. – Szabóné Berta, O. – Hörsik, Zs. T. (2022). The Current State of Vegetarianism in Hungary, Its Possible Effects on the Agricultural Structure and the Food System. South Western Journal of Horticulture, Biology and Environment, 13(1), 31–57.
- Csabai, J. – Szabó, B. – Kosztyuné Krajnyák, E. – Hörsik, Zs. T. – Nagy Makszim Györgyné, T. (2023). Examining Some Ideological Aspects of Vegetarianism. Scientific Bulletin of Uzhhorod University. Series Biology, 52, 32–36.
- Csécserits A. – Barabás S. – Csabai J. – Devescovi K. – Hanyecz K. – Höhn M. – Kósa G. – Németh A. – Orlóci L. – Papp L. – Pándi I. – Ruborits T. – Sütöriné Diószegi M. – Sztár K. – Tihanyi G. – ifj. Papp L. (2018). Hazai botanikus kerti tapasztalatok az európai uniós inváziós listán szereplő szárazföldi növényekkel kapcsolatban. Botanikai Közlemények, 105(1), 143–154. <https://doi.org/10.17716/BotKozlem.2018.105.1.143>
- Dorfmann, H.: 2018. JELENTÉS az élelmiszer-ágazat és a mezőgazdaság jövőjéről | A8-0178/2018 | Európai Parlament. forrás https://www.europarl.europa.eu/doceo/document/A-8-2018-0178_HU.html
- Gábor, P. G. K. (2023). Fenntartható beruházások finanszírozásának szerepe és lehetőségei az agráriumban.
- Grónás, V. – Centeri, C. – Magyar, J. – Belényesi, M.: 2006. Agrár-környezetgazdálkodási programok bevezetésének hatása a kijelölt mintaterületek földhasználatára és természeti értékeinek védelmére. Tájökológiai Lapok, 4(2), 277–289.
- Horváth, G. (2024). A „Zöld” Mezőgazdaság Jövőképeinek Meghatározó Alkotóelemei: A Laudato si’ Enciklika és egyes szupranacionális stratégiai dokumentumok (kiemelten az ENSZ SDG-célrendszere, az Európai Zöld Megállapodás és a „termelőtől a fogyasztóig” stratégia) tükrében. Iustum Aequum Salutare, 20, 149.
- Lámfalusi I. – Hámori J. – Rózsa A. – Goda P.: 2023. Környezeti fenntarthatóság a Közös Agrárpolitikában és az EU-taxonómiában. Gazdálkodás, 67(1).
- Takácsné Gy. K. (2022). A technológiai fejlődés hozzájárulása a fenntarthatósághoz az agrárgazdaságban. Gazdálkodás, 66(5).
- Léghő folyóirat—Kiadványok—Met.hu. (2025, július 18). HungaroMet Magyar Meteorológiai Szolgáltató Nonprofit Zrt. <https://www.met.hu/ismeret-tar/kiadvanyok/legkor/index.php?no=2022.1.4>
- Makszim Gy. N. T.: 2021. A Területfejlesztés aktuális kérdései Szabolcs-Szatmár-Bereg megyében. In: Tóth, Csilla (szerk.) ŐSHONOS- ÉS TÁJFAJTÁK – ÖKOTERMÉKEK – EGÉSZSÉGES TÁPLÁLKOZÁS – VIDÉKFEJLESZTÉS Minőségi élelmiszerek – Egészséges környezet – Fenntartható vidéki gazdálkodás : Az agrártudományok és a vidékfejlesztés kihívásai a XXI. században, Nyíregyháza, Magyarország : Nyíregyházi Egyetem, Műszaki és Agrártudományi Intézet 396 p. pp. 327-334. , 8 p.
- Makszim Gy. N. T.: 2023. A Térségi Vállalkozási Térszerkezeti Modell elméleti bemutatása. KOMMUNIKÁCIÓ MÉDIA GAZDASÁG 11 : 1 pp. 123-152. , 30 p.

- Makszim Gy. N. T.: 2022. Társadalmi folyamatok térszerkezetének vizsgálata. In: János, István (szerk.) Tradíció és innováció ötvözete a Nyíregyházi Egyetemen, Nyíregyháza, Magyarország : Nyíregyházi Egyetem (2022) 614 p. pp. 276-288. , 13 p.
- Makszim Gy. N. T. – Soós A.: 2025. Land Sharing and Land Sparing in Agriculture – Can We Change Our Attitudes? EUROCHOICES 24 : 1 pp. 43-49. , 7 p.
- Makszim Gy. N. T. – SOÓS A. – Kosztyuné K. E. – Csabai J. – Szabó B.: 2024. Az erdőgazdálkodás vármegyei szintű statisztikai elemzése 2000-2022 között, különös tekintettel a fenntartható erdőgazdálkodásra. In: Irinyiné, Oláh Katalin; Kosztyuné, Krajnyák Edit; Szabó, Béla; Bara, Eszter (szerk.) Fenntartható Tápanyag-gazdálkodási Tudományos Műhely Konferenciája 2024. Innovatív megoldások a XXI. század mezőgazdaságában : Konferencia kiadvány, Nyíregyháza, Magyarország : Nyíregyházi Egyetem, Műszaki és Agrártudományi Intézet (2024) 186 p. pp. 66-73. , 8 p.
- Mizik T.: 2018. Agrárgazdaságtan II. Az agrárfejlesztés mikro- és makroökonómiája. Akadémiai Kiadó, ISBN: 978 963 454 187 5
- Moravec M.: 2022. Diákok sportja - hallgatók egészségtökéje?: a mindennapos testnevelés jéghegy-modellje a hallgatói egészségtudatosság és eredményesség tükrében Szeged, Magyarország: Belvedere Meridionale, 273 p.
- Moravec M. – Kovács K. E.: 2025. The Role of Well-Being as a Value in Students' Health-Conscious Lifestyles in the Context of the Role of Daily Physical Education DOI: <https://doi.org/10.2478/pcssr-2025-0009>, PHYSICAL CULTURE AND SPORT STUDIES AND RESEARCH 2025 Paper: 2025-0009 (2025)
- Nagy T.: 2007. Small and Medium-Sized Enterprises at Present and in the Future in the Northern Great Plain Region and in Szabolcs-Szatmár-Bereg Country. ACTA BEREKSASIENSIS: A KÁRPÁTALJAI MAGYAR TANÁRKÉPZŐ FŐISKOLA ÉVKÖNYVE 6 : klmsz pp. 7-14. , 8 p.
- Száteleki P. – Solti I. – Bacsó Zs. – Pupos T.: 2024. A fenntarthatóság és versenyképesség kapcsolódási pontjai, a fennálló kölcsönhatások gazdasági vetületei a mezőgazdasági vállalatokban (Első rész: A mezőgazdasági fenntarthatóság értelmezése, alapelvei, agroökológiai megközelítés). Gazdálkodás, 68(1).
- Pretty, J. (2007). Agricultural sustainability: concepts, principles and evidence. Philosophical Transactions of the Royal Society B: Biological Sciences, 363(1491), 447-465.
- Schaller, N. (1993). The concept of agricultural sustainability. Agriculture, Ecosystems & Environment, 46(1-4), 89-97.
- Soós A. – Makszim Gy. N. T.: 2024. Károsodott környezeti elemek, kihívás előtt álló mezőgazdaság - mielőbbi megoldás a paradigmaváltás MEZŐGAZDASÁGI TECHNIKA (0026-1890): 65 1 pp 2-7 (2024)
- Takácsné György K.: 2020. A fenntartható gazdálkodás és a méretgazdaságosság kölcsönhatásai. Gazdálkodás - Agrárökonómiai Tudományos Folyóirat.
- Tibor, P. – András, N.: 2022. A fenntarthatóság értelmezése, annak komplex elméleti háttere. Gazdálkodás, 66(6).
- Vágvolgyi S. – Kosztyuné K. E.: 2025. Savanyú homoktalajok fenntartható hasznosításának agronómiai kihívásai a környezeti változások tükrében. In: Csajbók, József (szerk.) Kihívások és megoldások a szántóföldi növénytermesztésben : Prof. Dr. Pépó Péter 70 éves Debrecen, Magyarország : Debreceni Egyetem Mezőgazdaság-, Élelmiszertudományi és Környezetgazdálkodási Kar (2025) 330 p. pp. 222-227. , 6 p.
- Vilmos, L.: 2023. Fenntarthatóság, felelősségvállalás, tőkepiaci értékítélet. Gazdálkodás, 67(5).