

ADAPTING THE U.S. UNIVERSITY-BASED EXTENSION MODEL TO THE AKIS FRAMEWORK OF ROMANIA AND THE EUROPEAN UNION

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Abstract

This paper explores the feasibility of implementing a university-led agricultural extension system in Romania, aligned with the European Union's Agricultural Knowledge and Innovation System (AKIS). Drawing on comparative insights from the U.S. Cooperative Extension model, the study examines how agronomic universities can play a central role in bridging the gap between research, policy, and rural practice. Using a mixed methodological approach that includes PESTEL and SWOT analyses, a stakeholder matrix, and a GAP analysis, the paper identifies key systemic challenges: fragmented advisory structures, limited legal mandates, and underutilized academic capacity. Results suggest that while Romania has significant institutional and human potential, it lacks the structural coordination needed to meet EU expectations and fully access CAP and Horizon Europe funds. The proposed model emphasizes local engagement, digital knowledge sharing, and student involvement. If adopted, this approach could enhance Romania's alignment with EU policy goals, strengthen rural advisory services, and position universities as key actors in agricultural innovation and sustainability.

Key words: advisory, AKIS, CAP, cooperative extension, knowledge transfer

INTRODUCTION

Romania's agriculture is marked by strong cereal production but structural imbalances. While the country is a major EU exporter of wheat and maize, over 90% of its farms are small or subsistence-level, limiting efficiency and modernization. Despite high crop yields, Romania faces a significant meat trade deficit, relying heavily on imports to meet domestic demand. This reflects underdeveloped livestock sectors and weak processing capacity. Addressing these gaps requires not only investment and farm consolidation but also improved agricultural advisory services that can support informed, sustainable development across all farm sizes (Popescu et al., 2023; 2024).

Agricultural knowledge and advisory systems have long played a critical role in shaping the productivity, sustainability, and resilience of rural economies. Historically, the development of formal agricultural extension services emerged as a response to the need for structured dissemination of research-based practices to farmers, enabling them to improve yields, manage risks, and adapt to changing socio-economic and environmental conditions (Kania et al., 2014).

In the United States, the establishment of the Cooperative Extension System in 1914 through the Smith-Lever Act institutionalized a model of university-based outreach, grounded in collaboration between land-grant universities, local governments, and rural communities. This system has since become a global

benchmark for effective agricultural innovation transfer, combining research, education, and public service in a unified framework(Borron et al., 2019).

Within the European Union, efforts to modernize advisory services gained momentum with the reform of the Common Agricultural Policy (CAP) and the emergence of the Agricultural Knowledge and Innovation System (AKIS) concept in the early 2000s. AKIS promotes a decentralized yet interconnected approach, encouraging the integration of diverse actors—researchers, educators, advisors, farmers, and agri-food businesses—into a cohesive network that supports innovation and sustainability (Knierim et al., 2015; 2017). In recent CAP cycles (especially 2023–2027), AKIS has become a strategic priority, with member states required to coordinate national-level systems that support knowledge transfer, digitalization, and green transition in agriculture (Micu et al., 2022).

In Romania, the evolution of agricultural consultancy has been more fragmented. The socialist period institutionalized state-driven advisory mechanisms, but these were largely dismantled during the transition to a market economy. Attempts to rebuild a public extension network—such as through the former ANCA (Agenția Națională de Consultanță Agricolă) and county-level CDRJ units—have been partially successful but lacked continuity, integration with universities, and sustainable funding (Stefanescu et al., 2013). As a result, many Romanian farmers rely today on informal networks, private consultants, or social media platforms for technical guidance—often with inconsistent or unreliable results(Ciocan et al., 2024a).

Although Romania currently benefits from certain EU funding streams under the CAP and Horizon Europe, its access remains partial and underutilized due to the absence of a fully functional and recognized AKIS. Without a coherent national strategy that connects universities, research institutes, advisory services, and farmers in a coordinated system, Romania is unable to capitalize on the full range of funding instruments explicitly designed to support innovation, knowledge

transfer, and capacity building in agriculture (Dirimanova& Rusu, 2016).

A functioning AKIS, as defined by the European Commission, is a prerequisite for unlocking dedicated funding opportunities such as support for operational groups under EIP-AGRI, targeted training and advisory programs under CAP Strategic Plans, and multi-actor innovation projects financed through Horizon Europe. Establishing such a system would not only improve Romania's alignment with EU policy priorities, but would also significantly increase its eligibility and competitiveness in accessing structured financial support for agricultural modernization and rural development (European Commission, 2024) .

In this context, Romania faces a dual challenge: on one hand, to align with the EU's AKIS vision and strategic objectives, and on the other, to develop a model of knowledge transfer that is both cost-effective and deeply rooted in local realities(Toma et al., 2021). This article argues that a series of best practices inspired by the U.S. extension system, notably the integration of agronomic universities into community-based knowledge transfer can be successfully adapted to Romania's context and contribute meaningfully to the development of a national AKIS. These practices include the establishment of university-led extension hubs, the mobilization of students and faculty in applied research and advisory roles, and the development of digital platforms to support open-access knowledge sharing and community engagement. Such a model not only aligns with the EU's emphasis on innovation, sustainability, and youth involvement in agriculture, but also addresses specific structural gaps in the Romanian system (Ciocan et al., 2024b).

To evaluate the feasibility and implications of implementing this model within the AKIS and CAP framework, the article presents a combined PESTEL and SWOT analysis. This analytical approach highlights the political, economic, social, technological, environmental, and legal factors influencing knowledge transfer in Romanian agriculture, while identifying internal strengths and weaknesses, as well as external opportunities

and threats. The aim is to propose an actionable, scalable, and financially sustainable extension model that reinforces Romania's integration into the European knowledge economy and supports long-term rural transformation.

MATERIALS AND METHODS

This study explores the feasibility of adapting a university-led agricultural extension model to the Romanian context, in line with the European Union's Agricultural Knowledge and Innovation System (AKIS) framework. The research was conducted between January and March 2025 and is based on a conceptual, comparative, and policy-oriented methodology, with Romania as the focal case study and the European Union as the strategic reference framework.

A key asset in the research design was the direct institutional experience of the authors, acquired through participation in the Fulbright-RAF Scholar Program (2023–2024) in the United States. During this program, the authors engaged with the Cooperative Extension System at the University of Georgia, gaining practical insights into the structure, functioning, and university-community dynamics of a mature agricultural extension system. Although the American model is structurally more centralized and administratively less complex than the European AKIS framework, its operational simplicity, strong academic anchoring, and community focus provide a rich foundation of transferable practices relevant to Romania's needs (Ciocan et al., 2024b).

The methodological framework combined several strategic and institutional analysis tools, chosen for their complementarity and relevance to both the EU policy context and national implementation challenges.

First, a combined PESTEL and SWOT analysis was used to evaluate the current Romanian agricultural knowledge ecosystem. The PESTEL component assessed macro-environmental factors—Political, Economic, Social, Technological, Environmental, and Legal—while the SWOT component identified internal strengths and weaknesses, along with

external opportunities and threats. Together, these tools provided a holistic diagnostic of both strategic positioning and operational readiness for systemic change.

Furthermore, a Stakeholder Matrix (Power–Interest Grid) was used to map the main actors in the Romanian AKIS ecosystem. By categorizing stakeholders according to their influence and level of engagement, the analysis supported the identification of strategic partnerships, resistance points, and potential champions for reform.

To complement this, a GAP analysis was employed to highlight the discrepancy between Romania's current, fragmented knowledge and advisory landscape and the functional AKIS model promoted by the European Commission. This approach helped identify the institutional and procedural reforms necessary to align Romania with EU expectations and to unlock targeted funding opportunities under CAP and Horizon Europe.

The study draws upon a diverse set of sources, including:

- EU policy and legal frameworks (CAP regulations, AKIS guidelines)
- Romania's CAP Strategic Plan 2023–2027 and related national legislation
- Academic literature on agricultural extension and innovation systems
- Outputs from EU platforms such as EIP-AGRI and SCAR-AKIS
- Field observations and internal reports from the Fulbright-RAF program

The research relied exclusively on document analysis, strategic modeling, and comparative institutional insights.

Study Limitations: this study is exploratory and conceptual in nature. While grounded in international field exposure and strategic analysis, it does not include empirical validation through stakeholder interviews, surveys, or pilot implementations. As such, the proposals and conclusions presented herein should be seen as a foundation for further applied research and institutional experimentation. Future studies may expand upon this work through participatory design processes, case studies, and regionally specific

pilot programs to assess the model's effectiveness under real-world conditions.

RESULTS AND DISCUSSIONS

To assess the feasibility and systemic compatibility of implementing a university-based agricultural extension system in Romania, a combined PESTEL and SWOT analysis was conducted. This dual framework offers an integrated perspective on both the external macro-environmental factors influencing implementation and the internal structural conditions of the Romanian agronomic and institutional landscape. The analysis reflects the strategic alignment of such a model with the AKIS (Agricultural Knowledge and Innovation System) principles promoted by the European Union.

1. Political Dimension

The EU's Common Agricultural Policy (CAP 2023–2027) mandates the development of national AKIS frameworks. This provides both pressure and opportunity for reform. However, Romania suffers from administrative fragmentation and lacks a unified political commitment to agricultural innovation and knowledge transfer (MADR, 2022).

SWOT Analysis:

- **Strengths:** Alignment with EU directives provides a legitimate framework for reform; academic institutions have policy credibility.
- **Weaknesses:** Romanian universities currently have no formal political mandate in national advisory structures.
- **Opportunities:** Political momentum for AKIS offers universities a chance to claim institutional roles in policy.
- **Threats:** Policy inconsistency, centralization, and institutional inertia may delay or undermine integration efforts.

2. Economic Dimension

There is substantial EU funding available for AKIS-compatible systems through Horizon Europe, EIP-AGRI, and national CAP Strategic Plans. Yet, Romania may miss out due to the absence of an operational, recognized AKIS (Kountios et al., 2024).

SWOT Analysis:

- **Strengths:** Universities have the capacity to

write, manage, and implement EU projects; academic networks increase competitiveness.

- **Weaknesses:** Lack of a consolidated extension infrastructure limits absorption capacity.

- **Opportunities:** Universities can become eligible beneficiaries of dedicated EU AKIS funding once integrated into national strategy.
- **Threats:** Continued underfunding and overreliance on short-term projects could undermine sustainability.

3. Social Dimension

Romania's rural population is aging, and smallholder farmers often lack access to modern advisory services (Smedescu et al., 2024). At the same time, universities remain largely disconnected from these communities, despite their educational mission and regional presence.

SWOT Analysis:

- **Strengths:** Universities possess credibility and have the tools for outreach (student projects, community programs).

- **Weaknesses:** Weak social ties with local farming communities; limited tradition of grassroots engagement.

- **Opportunities:** Extension programs can strengthen community trust and promote youth engagement in agriculture.

- **Threats:** Social mistrust of institutional actors and reliance on informal sources (e.g., social media) could hinder adoption.

4. Technological Dimension

Digital platforms for knowledge sharing and remote advisory services are increasingly important, but Romania's rural digital literacy remains uneven. Universities, as knowledge hubs, are well-positioned to drive digital integration (Pascal & Turek-Rahoveanu, 2023).

SWOT Analysis:

- **Strengths:** Access to IT infrastructure and expertise within universities; capacity to develop and manage digital tools.

- **Weaknesses:** Lack of institutional coordination for outreach and support in rural digital engagement.

- **Opportunities:** Universities can lead digitalization through smart agriculture initiatives, apps, e-learning, and virtual advisory.

•Threats: Digital divide in rural areas may exclude the very beneficiaries the system aims to support.

5. Environmental Dimension

The European Green Deal and Farm to Fork Strategy emphasize the urgent need for environmentally sustainable agriculture (Smedescu et al., 2023). Extension systems must play a central role in disseminating green practices.

SWOT Analysis:

•Strengths: Universities are leaders in agronomic research on sustainability, climate adaptation, and biodiversity.

•Weaknesses: Environmental research is often disconnected from practice; limited translational mechanisms exist.

•Opportunities: Extension hubs can become catalysts for the practical adoption of green technologies and regenerative agriculture.

•Threats: Delays in knowledge transfer may prevent farmers from complying with upcoming sustainability regulations.

6. Legal Dimension

While EU legislation encourages the integration of education and research institutions in AKIS. (Kountios et al., 2024). Romania lacks a legal framework that formally assigns roles to universities in the advisory ecosystem.

SWOT Analysis:

•Strengths: Universities can align rapidly with EU-compliant roles once recognized.

•Weaknesses: Absence of legal status as advisory actors prevents funding access and coordination.

•Opportunities: New legal provisions could redefine AKIS structure and empower academic institutions.

•Threats: Legislative delays or political resistance could limit universities' involvement and block structural funding access.

The combined PESTEL and SWOT analysis suggests that Romania holds strong foundational potential for developing a university-based extension model that aligns with AKIS principles. Political and economic conditions are broadly favorable, due to EU strategic orientation and funding mechanisms, while social and technological dimensions

point to real opportunities for universities to assume an active extension role. However, internal institutional barriers, including funding constraints, legal ambiguity, and weak inter-actor coordination, must be addressed.

This analysis supports the notion that an academically anchored extension system, if properly designed and integrated into Romania's national AKIS, could enhance knowledge transfer, increase farmer resilience, and unlock underexploited EU funding opportunities.

To ensure the successful implementation of a university-based agricultural extension model aligned with the European Union's AKIS framework, it is essential to understand the roles, interests, and levels of influence of key institutional actors.

The Stakeholder matrix presented in Figure 1 offers a strategic overview of the main entities involved or affected by the development of an integrated knowledge and advisory system in Romania.

By mapping stakeholders along two axes—Power/Influence and Interest—this matrix identifies the potential allies, decision-makers, and beneficiaries whose engagement is crucial for system-wide reform and sustainability.

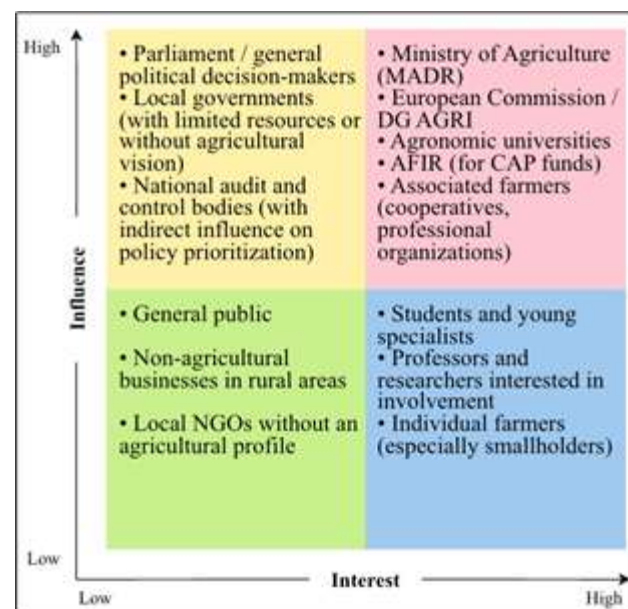


Fig. 1. Stakeholder matrix

Source: Adapted from Mendelow's Matrix and institutional mapping frameworks used in AKIS policy evaluations (Knierim et al., 2017; European Commission, 2024) [7, 4].

To understand the structural and functional challenges that hinder Romania’s integration into the European Union’s Agricultural Knowledge and Innovation System (AKIS), a GAP analysis was conducted.

This method allows for the identification of key discrepancies between the current national advisory and educational landscape and the desired state envisioned by EU policy frameworks, particularly under the Common Agricultural Policy (CAP 2023–2027).

The analysis focuses on seven critical dimensions—institutional integration, legal framework, funding access, knowledge transfer mechanisms, digital infrastructure, stakeholder participation, and human capacity.

For each of these areas, the current situation in Romania is compared against EU expectations, revealing institutional gaps that must be addressed in order to unlock funding, improve performance, and formalize the role of agronomic universities in the national extension system.

Table 1 summarizes the findings and outlines strategic recommendations that can support the development of a functioning, EU-recognized AKIS in Romania.

The GAP analysis presented in Table 1 highlights the critical misalignments between Romania’s current advisory and institutional landscape and the integrated, collaborative structure required by the EU-AKIS framework.

Table 1. GAP analysis of Romania’s AKIS (compared to EU expectations)

Dimension	Current State in Romania	AKIS-Required State (Target)	Identified Gaps	Recommended Actions
Institutional integration	Fragmented responsibilities among DAJ, MADR, private consultants; universities are marginal actors	Coherent network of research, education, advisory, and farming sectors	Lack of national coordination and formal university involvement	Create a centralized coordination body and legally define the role of universities in AKIS
Legal framework	No legal status for universities as extension providers	Legal recognition of all AKIS actors, including higher education	Universities excluded from funding and policy design	Introduce amendments to national legislation to include academic institutions in the advisory system
Funding access	Limited project-based funding; universities depend on research grants	Access to CAP, Horizon Europe, and EIP-AGRI through AKIS integration	Ineligibility due to lack of official role in advisory services	Establish eligibility through legal integration and AKIS recognition
Knowledge transfer mechanisms	Academic research rarely reaches farmers; limited extension infrastructure	Multi-directional knowledge flow between farmers, researchers, advisors	Missing interface between university output and farmer needs	Develop university extension offices and digital knowledge platforms
Digitalization & tools	Uneven digital adoption in rural areas; no unified extension platform	Digital knowledge sharing, e-advisory services	Lack of infrastructure and rural connectivity gaps	Invest in university-driven digital platforms and rural digital inclusion
Stakeholder participation	Weak farmer–university engagement; lack of incentives for collaboration	Co-creation with farmers, advisors, researchers in innovation networks	Low trust, limited feedback from farmers, missing multi-actor formats	Pilot participatory models (e.g., operational groups, student–farmer teams)
Human capacity	Isolated academic staff; few extension-trained professionals	Skilled human resources trained in facilitation, innovation, outreach	No institutional training or incentives for academic outreach	Provide training and incentives for university staff and students in extension roles

Source: Adapted from EU AKIS diagnostic tools (European Commission, 2024), and institutional analysis frameworks applied in Ciocan et al. (2024b) and Rusu et al. (2015) [4, 3, 13].

While significant academic and structural potential exists, systemic barriers such as legal exclusion, weak coordination, and limited funding access continue to hinder meaningful progress. Addressing these gaps through targeted reforms and strategic investments will be essential for building a functional, EU-

recognized AKIS that empowers universities as key drivers of agricultural innovation and rural development.

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CONCLUSIONS

This article has argued that a university-led agricultural extension system represents a viable and strategic pathway for Romania to modernize its knowledge transfer infrastructure and align itself with the broader ambitions of the European Union under the Agricultural Knowledge and Innovation System (AKIS) framework. The comparative perspective offered by the U.S. Cooperative Extension System, while rooted in a different socio-political context, provides compelling examples of how academic institutions can become not only sources of research and education but also active participants in rural transformation. What emerges from the analysis is a complex but actionable picture. Romania is not lacking in human capital or institutional expertise—on the contrary, its agronomic universities are home to experienced researchers, motivated students, and a growing interest in applied, field-based education. However, these resources remain underutilized due to systemic issues such as unclear legal status, fragmented governance, and the absence of a coordinated national strategy for advisory services.

The results of the combined PESTEL, SWOT, stakeholder, and GAP analyses highlight how deeply interwoven these structural limitations are. For example, without a legal mandate, universities cannot access certain funding streams. Without funding, they cannot institutionalize extension offices or train dedicated personnel. And without people and structure, meaningful engagement with rural

communities remains sporadic and unsystematic. In short, without a coordinated framework—both conceptual and practical—the existing academic potential is unable to translate into real-world impact.

Yet, this diagnosis is not cause for resignation. On the contrary, it reveals a map of strategic intervention points. By addressing legal ambiguities, enhancing inter-institutional cooperation, and piloting practical outreach programs, Romania could build a cost-effective, participatory, and scalable extension model. Such a system would not only provide farmers with access to timely and relevant information but would also offer universities a new sense of relevance and public mission. Moreover, by involving students directly in community engagement and knowledge transfer, the model would enhance experiential learning and help prepare a new generation of professionals who understand the complexities of modern agriculture beyond the classroom or laboratory.

This approach also aligns with emerging trends in European policy, where funding is increasingly tied to impact, inclusiveness, and innovation. A Romanian AKIS that successfully integrates academic, advisory, and practical agricultural sectors would be far more competitive in securing long-term support through Horizon Europe, EIP-AGRI, and CAP Strategic Plans. It would also resonate with the goals of the European Green Deal, Farm to Fork Strategy, and broader sustainability objectives. Finally, and perhaps most importantly, the development of such a model represents an opportunity to restore trust and coherence within the rural knowledge ecosystem. In a time when farmers often turn to informal or unreliable sources for information, the presence of a respected, accessible, and responsive university-based extension system could help re-establish a foundation for evidence-based agricultural practice. This is not merely a technical upgrade, but a cultural and institutional shift toward long-term resilience. In conclusion, the path forward is clear, if not necessarily easy. Romania has the ingredients necessary to build an AKIS that is not only functional but exemplary within the EU. What is needed now

is a coordinated push—anchored in policy, backed by funding, and driven by institutions willing to engage with the complexity of rural realities. If this momentum can be sustained, agronomic universities can become more than academic centers; they can become catalysts for regional development, social innovation, and the revitalization of the Romanian countryside.

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