INNOVATION AND KNOWLEDGE TRANSFER IN AGRICULTURE: THE ROLE OF THE AKIS SYSTEM FOR SUSTAINABLE DEVELOPMENT

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1 INTRODUCTION

Humanity is facing serious problems today, such as poverty, inequality, water and food shortages (Meadows et al., 2013). With continued population growth and rising living standards in developed countries, more food is being produced, which is harder to produce due to deteriorating soil quality and water scarcity [2]. Innovation is a key issue today, especially in terms of its economic and social impact [3]. Targeted support and funding for research, innovation and technological development at both national and international level is key to increasing labour productivity and maintaining the competitiveness of economic actors. Encouraging investment in this area is of particular importance for the European Union (EU) as it contributes to maintaining and further strengthening its competitiveness. Systematic exploitation of existing knowledge and targeted development of human resources to support innovation are therefore essential to boost innovation performance.

2 MATERIAL AND METHODS

Systemic exploitation of existing knowledge and targeted development of human resources to support innovation are essential to boost innovation performance.

The Agricultural Knowledge and Innovation System (AKIS) is a comprehensive, horizontal system covering the whole spectrum of the agricultural sector. It aims to contribute to strengthening the EU‘s competitiveness through mechanisms for agricultural knowledge transfer and sharing. A key role of the AKIS is to effectively transfer and translate innovations in the agricultural sector into practical applications, mainly through extension services [4].

The Common Agricultural Policy for the period 2023-2027 puts a strong emphasis on the use of interactive innovation models through EIP-AGRI (European Innovation Partnership) projects. These models aim to integrate innovation processes more closely into the agricultural and rural development sector, thereby promoting sustainable development [5].

The study presents the actors and their functioning of the Hungarian AKIS model, highlighting the impact of interactive innovation on the agricultural sector. It analyses the results of the 2024 AKIS survey of the i2connect project on agri-innovation activities, and examines knowledge sharing between actors and the specificities of the advisory system in supporting innovation.

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In the questionnaire survey, the researchers asked, among others, the following questions related to innovation: Through which channels do you gain new knowledge for your work as an advisor? Have you participated in national or international research cooperations? Have you engaged in international or national research activities? If so, in what form? If you carry out (innovation) research, where do you do it (physically/where)? These questions will be answered by presenting the results of a survey carried out in the framework of the i2connect project.

The authors of this publication define the Hungarian AKIS as a network that connects people and institutions to promote mutual learning and co-creation, sharing and application of agricultural innovations, technologies, knowledge and information [6].

Overall, advisors play an important role in the spread of innovation through knowledge transfer and knowledge sharing [7], the practical implementation of which is advisors connect AKIS actors with the aim of jointly seeking solutions to actual problems, based on existing knowledge, for the purpose of research, development and meeting societal expectations.

The research covered Hungary and targeted agricultural and forestry advisors. It examined the Hungarian Farm Advisory System (FAS) within the AKIS framework, focusing on bottom--up initiatives as part of the i2connect H2020 project. Conducted in early 2024, the survey included 27 questions and a suggestion section, sent electronically to 100 advisors, yielding 70 responses. The survey, completed anonymously via Google Forms, took 25–30 minutes on average. It focused on general advisor demographics and AKIS-related topics like innovation, training, and cooperation.

3 RESULTS

The questionnaire survey investigated the access of advisors to new knowledge related to research and innovation, in terms of how these knowledge sources help to bottom up innovation through advisors. In response to questions on the functioning of AKIS and the agricultural extension system, the following answers were given by the advisors.

The survey examined advisors‘ innovation activities and cooperation, revealing that 40% are involved in national or international cooperation, while 60% are not, often due to lack of information, resources, institutional support, or language skills. Among 70 advisors, 59 reported cooperation, primarily with universities (34%), input suppliers (24%), and research institutes (19%), while international programmes like EU Horizon Europe (6.8%) and the European Innovation Partnership (12%) saw lower participation, highlighting the need for more incentives.

Most innovation experiments (57%) occur on clients‘ farms, indicating direct technology testing, while fewer are conducted on advisors‘ own farms (10%) or demonstration farms (7%), suggesting limited infrastructure or motivation. A significant 26% do not conduct innovation experiments at all.

Advisors emphasized in the research the importance of knowledge transfer, training, and digitalization to enhance cooperation and innovation within the AKIS system, highlighting the role of skills development in improving advisory services.

4 CONCLUSIONS

Agricultural innovation and knowledge transfer are vital for sustainable development and global food security. Challenges like population growth, climate change, and limited resources demand ongoing agricultural development and new technologies. Sustainable innovation is crucial for productivity and competitiveness.

The Agricultural Knowledge and Innovation System (AKIS) is central to sharing innovation and knowledge transfer. Researchers, farmers, advisors, and institutions collaborate to implement new scientific and technological advancements. Advisors are key in translating knowledge into practice.

Research shows many advisors are involved in national or international cooperation, but more incentives are needed to boost participation. Collaboration with universities, research institutes, and industry enhances innovation but requires better international integration. Challenges include limited information, resources, and institutional support, which targeted training and programs can address.

Most advisor-led innovation experiments occur on farms, allowing direct technology testing. However, controlled experimentation is lacking, potentially hindering improvement effectiveness. Promoting such experimentation and enhancing demonstration farms can speed up innovation adoption.

In summary, effective innovation diffusion requires stronger knowledge transfer and advisor roles. Continuous training, collaboration, and supportive mechanisms are vital for advancing agricultural innovation. Strengthening the AKIS system and integrating digital technologies are essential for developing a sustainable, competitive agricultural sector.

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