

New Approaches to Knowledge Management in Agriculture of Georgia

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The existing mechanisms of agricultural knowledge and innovation in Georgia were studied and assessed. The stakeholders involved in them, institutions creating information and knowledge, introducing and using innovative agro-, bio-, nano-, climate-smart and circular technologies were identified. Among them, the existing connections and coordination mechanisms were structured. The result presents a unified vision and strategy for coordination networks involving agricultural extension and information/innovation organizations. Current problems in agricultural education and information, as well as innovation systems of Georgia were discussed. This provides an opportunity to consolidate the National Agricultural Knowledge and Innovation system and institutionalize this system. © 2024 Bull. Georg. Natl. Acad. Sci.

agriculture knowledge and innovation systems (AKIS), innovative technology, extension system

In 2020, the United Nations Development Program (UNDP), within the framework of the project – “Modernization of Vocational Education and Training Systems in Georgian Agriculture” (Phase 2), financed by the Swiss Agency for Development and Cooperation (SDC), developed the document “Agricultural Knowledge and Information System Analysis.”

Its preparation was aimed at research of the existing and operating agricultural institutions in Georgia that carried out the dissemination of knowledge and information in rural areas of the country, and establishment of connections and coordination mechanisms existed between them. As a result, a unified vision document of the networks, in which agriculture knowledge and

information-disseminating organizations were involved, was created. The paper discusses the challenges of Georgian agricultural knowledge and information/innovation systems.

Research Conditions

The goal of the research conducted since 2020 was to identify the players in Georgia agricultural knowledge and information system.

Various participants from public services were identified, among which important bodies were the Ministry of Environment Protection and Agriculture of Georgia, with its information-consulting Centers at the regional and municipal levels, the bodies of the Ministry of Education, Science, Culture and Sports of Georgia, which at that time

were entrusted with professional education and training and higher education. Implementation functions, as well as subordinate units of the Ministry of Economy and Sustainable Development, promoted the development of exports in all sectors of the economy, including agriculture, and the creation of start-ups [1].

As for education, eight universities and nine vocational education colleges had agricultural sector programs. The research direction was carried out by the Scientific-Research Center of Agricultural of Georgia, established in 2014, the Academy of Agricultural Sciences of Georgia, with many years of experience, and research groups of various universities and private companies (especially companies supplying materials). In addition, farmers' organizations and professional associations producing various general and specific commodities were identified [2].

Analytical studies established that agricultural and environmental issues received the greatest attention worldwide in recent years. The top ten problems of humanity in the next 50 years were named: energy, water, food, environment, poverty, terrorism and war, disease, education, democracy, and population (Smalley Institute, 2008) [3], which shows the urgency of the issue.

To make agricultural production profitable, it is important to have access to new technologies, both informationally and financially, to the fundamental question of what measures are needed to bring about the necessary changes [4]. To overcome the existing difficulties and further develop the agricultural knowledge and information/innovation system, it is recommended to integrate the concept of agriculture knowledge and information/innovation system in the larger context of strategy and policy, to clarify/identify the roles and responsibilities of the participants of the agricultural knowledge and innovation system, specific Strengthening key actors and fostering linkages between fragmented subsystems. It is also recommended that knowledge centers for specific

agricultural domains be created, the successful digital transformation should be continued, a participatory approach and applied research should be promoted, institutional and financial sustainability should be achieved, and the system should be analyzed from the farmer's perspective.

Analysis of the Results

In conducting the above studies, the private sector, especially the producers of raw materials, has been identified as playing an important role in providing products, services, and information and introducing innovative technologies and practices. Research conducted at that time revealed that there were many connections between the participants of the agricultural knowledge and information system. Most of the connections were made by donors or within the framework of state-funded projects. It was the same in the case of the coordination mechanism – various mechanisms were identified, although their effectiveness was mostly very low, and key stakeholders agreed that improving these works and ensuring the sustainability of such coordination mechanisms were essential.

In the process of work, the main strengths and weaknesses of the Georgian system of agricultural knowledge and information, the common desire to strengthen the agricultural knowledge system, public and private networks throughout the country, and “strong leaders of change” were determined. Despite this, agricultural knowledge in Georgia and the information system had many weaknesses, including a lack of coherence and coordination, sustainability, skills, and understanding of farmers' needs and practices. The research established three main opinions: the modern system of agriculture knowledge and information is relatively weak and fragmented, and it should be strengthened, but there is no common vision of its development direction (Table).

Table. A brief description of the challenges in agriculture

Indicator	Causative factors					
Population	Population growth	Urbanization	Changing food regimes	Changing the consumer mindset		
Work	Aging farmers	The growing situation of migration	Need for mechanization/ replacement of manual labor			
Capital	Increased requirements	Scarcity of access to capital				
Natural resources	Climate change	Scarcity of water resources; Scarcity of windbreaks	Reduction of agricultural land; Deterioration of the environment Water and wind erosion.	New pests and diseases		
Technologies	Access to technology, investment in new technologies	Identify types of research: fundamental, applied, qualitative, quantitative	Use of data	Innovations	Adapted (zoned) varieties and species	
Entrepreneurship	Value chain	Business innovations, farm management-management, and planning	unified network (connections)	Expanding access	Weak organization	Need for knowledge and information
Markets	Access to market	Negotiating positions	<ul style="list-style-type: none"> • Quality standards • Food safety standards • Certification • Traceability 	Market research		

In today's reality, against the background of the implementation of certain institutional changes at the level of systemic development, which include the creation of new institutions, such as the Skills Agency, as well as the transformation of the existing information and advisory (Extension) service system in the structure of the Ministry of Environmental Protection and Agriculture into the structure of the Rural Development Agency (RDA) [5].

It slowly added functions necessary for new development, such as current agriculture projects, preferential packages for farmers of various directions, and targeted programs.

The System of Agricultural Knowledge and Information was modified, where more orientation

was made on innovation (innovation itself includes information).

The Agricultural Knowledge and Innovation System (AKIS) in Georgia is described as an effective mechanism of unified coordination, mainly in the context of today's agricultural policy. A complex and dynamic system is included, where a wide range of participants is represented. This makes it possible to identify and implement specific mechanisms of cooperation that are interesting and important for the country within the framework of effective communication. The success of these mechanisms and a unified system depends on internal coordination between sectors and the active involvement of the private sector. For the system to function successfully, the parties

involved should work closely to become more competent through joint projects and be ready to provide services tailored to farmers, whether knowledge dissemination or innovation introduction-diffusion. The development of effective coordination mechanisms should be thematically aligned with the institutions.

For the overviewing of the international AKIS short historical line, which well expresses this strategic direction, has developed as follows:

- the 1980s – Agricultural Knowledge System (AKS)
- Agricultural Knowledge and Information System (AKIS) since the 1990s
- By the end of the 20th century, a new innovation-oriented system was independently created – the Agrarian Innovation System (AIS), which still functions actively in many European countries.
- After 2010, the two systems AKIS and AIS were merged into one system, and today it is presented as AKIS, where the word information is replaced by innovation, and in the strategic load documents it is already integrated with full implementation mechanism packages.

The AKIS strategic approach is based on the European Union Regulation (EU) No. 2021/2115, the Common European Agricultural Policy (CAP)[6] and is expressed through the following 4 types of joint interventions:

1. Knowledge generation, information dissemination, and exchange. including knowledge exchange and information dissemination, innovation promotion, training and advice, and other forms of knowledge exchange and information dissemination;
2. Advisory services of farmers (extension). Farmers' district services should be integrated into a single AKIS system, which creates systematized services for advisors, researchers, farmers' associations, and other interested parties;
3. Innovative projects of Operational Groups (OG) under the auspices of the European Innovation

Partnership (EIP). Providing innovative solutions, bringing together partners with knowledge and information;

4. Digitization. which considers the effective management and use of information and communication technologies, which provides effective access to the necessary information.

Currently, Georgia, along with the rest of the world, is facing such important global challenges of the 21st century as climate change, natural disasters, and food security and food safety. Georgia fully shares the UN's 2030 Sustainable Development Goals and has nationalized all 17 goals and 93 tasks, including forecasting and early warning of climate-related extreme events and environmental stresses and disasters; Increasing agricultural productivity and incomes of small food producers, in particular women, youth, family farms, and fishermen; Promotion of sustainable management of all types of forests and land, restoration of degradable forests and artificial and natural renewal of forests, preservation of biodiversity, etc [7].

National strategies, including the Strategy for Agriculture and Rural Development of Georgia for 2021-2027 and the Fourth National Environmental Action Program of Georgia for 2022-2026 (NEAP 4), also reflect these objectives [8].

The National Extension Strategy (working version) outlines the AKIS system, which takes into account all the approaches that correspond to the concept of AKIS of Georgia presented above. The strategy also emphasizes the role of state extension, although extension services can play a supporting role in AKIS without being dominant in this system. The extension system is a mechanism by which actors create, share, and use knowledge and innovative technologies for agriculture and related economic sectors, including climate-smart technologies, protection of biodiversity from genetic erosion, development of bio and nano technologies, green and circular economy, precise and friendly agriculture, green professions, agro and eco-

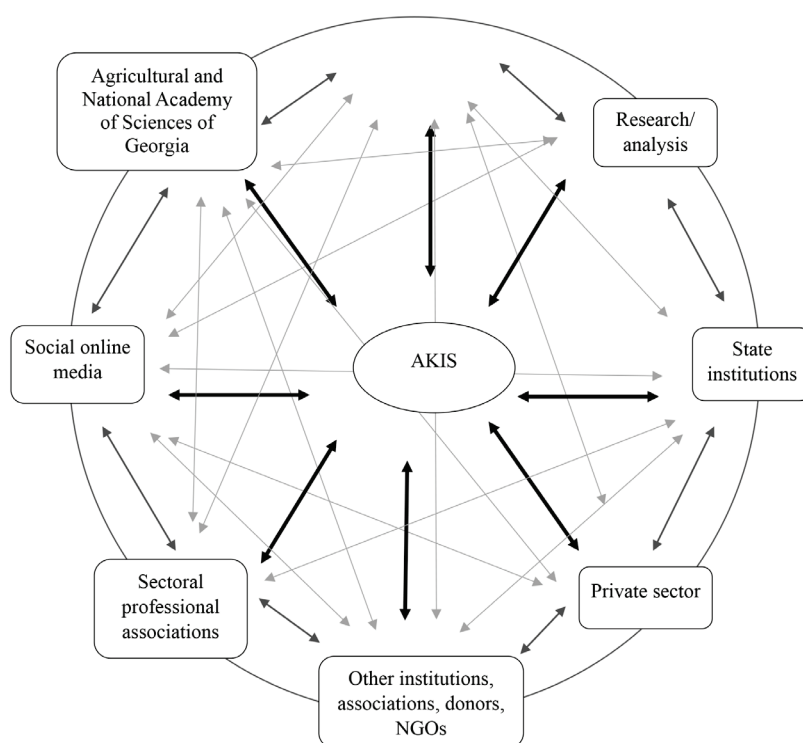


Figure. Development scheme of AKIS in Georgia.

tourism in rural areas, community societies, consumers, etc. Farmers must be represented at the center of the system as the main beneficiaries receivers and creators of services [9].

In Georgia's agricultural sector, it is important to ensure a well-functioning AKIS is in place at the national level to avoid duplication of efforts, save time and costs, increase the impact of financing, and accelerate access to innovative technologies (Figure) [10].

Conclusions

The agricultural knowledge and innovation system is an important cornerstone of Georgia's agriculture for rural development. The findings discussed above show that the system involves participants from both the public and private sectors who are connected in the direction of service development. However, they

also have other target and thematic loads, as well as different target groups. Each side is important to the effective functioning of the system. It is also significant that the specifics of intra-disciplinary and inter-disciplinary coordination are certain. One of the most important components for the development of agriculture and related fields is strengthening the existing, albeit segmented, system of agrarian knowledge and innovation and increasing its effectiveness. The Agricultural Knowledge and Innovation System (AKIS) is a multi-actor, one of the most important cornerstones of the EU agricultural policy, and to protect the ecological environment of Georgia and the further development of agriculture, it is essential that these approaches are widely introduced and systematically implemented in Georgia.

ეკონომიკა

ცოდნის მართვის ახალი მიდგომები საქართველოს სოფლის მეურნეობაში

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** გარემოსდაცვითი ინფორმაციისა და განათლების ცენტრი, თბილისი, საქართველო

შესწავლილი და შეფასებულია საქართველოში სასოფლო-სამეურნეო ცოდნისა და ინოვაციების არსებული მექანიზმები. იდენტიფიცირებულია მასში ჩართული დაინტერესებული მხარეები, ინსტიტუციები, რომლებიც ქმნიან ინფორმაციას და ცოდნას, ნერგავენ და გამოიყენებენ ინოვაციურ აგრო-, ბიო-, ნანო-, კლიმატ-გონივრულ და ცირკულარულ ტექნოლოგიებს. მათ შორის, სტრუქტურირებულია არსებული კავშირები და კოორდინაციის მექანიზმები. შედეგად წარმოდგენილია კოორდინაციის ქსელების ერთიანი ხედვა და სტრატეგია, რომელშიც ჩართულნი არიან სასოფლო-სამეურნეო ცოდნის და ინფორმაციის/ინოვაციის გამავრცელებელი ორგანიზაციები. განხილულია საქართველოს სასოფლო-სამეურნეო განათლებისა და ინფორმაციის, აგრეთვე ინოვაციების სისტემების დღევანდელი გამოწვევები, რომლებიც ერთიანი ეროვნული სასოფლო-სამეურნეო ცოდნისა და ინოვაციების კონსოლიდაციის და ამ სისტემის ინსტიტუციონალიზაციის შესაძლებლობას ქმნის.

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