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Agricultural knowledge and information system: Lessons lerand in the postsocialist period in Romania and Bulgaria

AGRICULTURAL KNOWLEDGE AND INFORMATION SYSTEM: LESSONS LERAND IN THE POSTSOCIALIST PERIOD IN ROMANIA AND BULGARIA

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Abstract: *The new challenges facing Eastern European rural and agricultural sector impose, among other things, a review of the links between knowledge production and its use to promote innovation. Given that, agriculture is the main source of livelihood for a large part of the rural population in Romania and Bulgaria and its development requires multiple interventions that include, inter alia, ensuring effective transfer of agricultural modern knowledge, technologies, methods and practices to the direct beneficiaries - farmers. Both in Romania and Bulgaria, agricultural knowledge generation (research), transfer (extension) and use (farmers as end users) passed during the post-socialist period through important changes. The main objective of this paper is to analyze the Agricultural Knowledge and Information System (AKIS), in the two countries, in terms of pursued objectives, structure and performed functions. Based on this analysis the authors synthesize the main lessons learned during the post-socialist period in the two countries, and outline the future direction of development of agricultural knowledge, production, transfer and use them in agreement with European requirements.*

Key words: *AKIS, agricultural extension, agricultural research and education, Romania, Bulgaria*

INTRODUCTION

Agriculture is an important branch in the national economies of Romania (RO) and Bulgaria (BG) and it is considering a key sector for economic and social prosperity. According to European statistics, the two countries have important land resources - 14.6 million hectares of agricultural land in RO and 5.5 million hectares in BG, which means 63.0% and 50.0% of the countries total area. Among of the agricultural use categories, arable lands are prevailing - 63.2% in RO and 63.4% in BG. The agricultural workforce is another important resource of both countries: 30.0% of total employment in RO and 19.2% in BG. Although, in recent years it has been a downward trend, it is oversized compared to the EU27 average (5.1%) (EC, 2015). Considering that the share of agriculture in GDP is modest situation shows a low level of labor productivity.

In terms of the farms structure, large farms that were prevalent during the communist regime recorded radical changes after 1989; agricultural land was restituted to private owners and farm structure has changed drastically. Agriculture of the two countries shows a pronounced polarization: in RO, small farms below two hectares have a share of 74.3% in total farms and 13.0% of total agricultural area; in BG farms smaller than 2 hectares has a share of 83.2% of numbers and 4.0% of agricultural land (EC, 2015). These small-scale farmers use modern technologies at low level: they are unable to purchase modern agricultural inputs - seeds, fertilizers, chemicals etc. Accordingly, yields and total production, both in the plant and in animal husbandry, are low and have significant annual variations, closely correlated with climatic conditions (Rusu, 2013). Taking into account the characteristics of agriculture of both countries, where most of the farmers lack adequate knowledge, experience and skills, in terms of agricultural development and the relevant EU requirements, the need for agricultural information and consulting services is pressing. In modern society, knowledge has become an important factor of production alongside land, labor and capital. Balit (1998) pointed out that the cheapest input is knowledge.

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MATERIAL AND METHODS

The main objective of this paper is to analyze the Agricultural Knowledge and Information System (AKIS), in RO and BG, in terms of evolution, objectives, structure and accomplished functions. Based on comparative analysis of the literature concerning AKIS, the authors summarize the main learned lessons in post-socialist period in the two countries, and outline the future direction of development of the generation, transfer and use of agricultural knowledge, in line with European requirements. Statistical data were collected from specialized publications, both in Europe and in the two analyzed countries.

RESULTS AND DISCUSSIONS

Agricultural development is an area of interest to all countries, regardless of their economic development. Economic and social progress has a close correlation with the achievements in agriculture: a competitive agricultural sector is closely linked to an efficient system of information and knowledge in agriculture.

1. AKIS definition

In the sixties, the flow of agricultural knowledge is considered as having a linear path from research to advice and then to farmers. This model was based on an institutional division: research was carried out in research institutes, transfer of new knowledge was the responsibility of consulting organizations and farmers' role was to implement the recommendations. Thus, the concept of Agricultural Knowledge System (AKS) became operational, used to define both a set of public and private organizations dedicated to research, education, consultancy, and their interaction with the users' knowledge, which are traditionally farmers (Hermans, Klerkx and Roep, 2010).

In the 1970s, organizations, such as FAO, introduced the concept of Agricultural Knowledge and Information System (AKIS). It developed from AKS concept by emphasizing the process of generating knowledge and the inclusion of actors outside the research, education and consultancy. Adding an "I" in the acronym, AKS has been linked of increased attention to information. The original wording described a set of organizations and / or persons from the agricultural sector and linkages and interactions between them. These organizations and persons are engaged in the generation, transformation, transmission, storage, retrieval, integration, dissemination and use of knowledge and information in order to support decision-making in solving problems in agriculture (Röling and Engel, 1991). Recently, AKIS concept has evolved and the letter "I" has a secondary meaning acquired, namely, innovation. Important characteristics of an innovation system are institutional infrastructure, funding mechanisms, networking capabilities and market structure (Woolthuis Klein et al. 2005).

In conclusion, linking institutions and persons, AKIS was created to promote mutual learning and facilitated use of modern technologies, agricultural knowledge and information in the participatory manner. The system integrates farmers, agricultural research, agricultural education, and agricultural advisory and private system to capitalize knowledge and information from various sources in order to develop agriculture.

2. AKIS in Romania and Bulgaria: main actors, objectives, evolutions and characteristics

Both in Romania and Bulgaria, AKIS was and is represented by different institutions belonging to the public sector (ministries of agriculture and their territorial structures) and private sector (consultancy private services, independent advisers, trade international organizations, regional suppliers), agricultural organizations (cooperatives and producer groups), research and educational organizations and non-governmental organizations (professional organizations and foundations).

2.1. Agricultural advisory service

Important structural changes that have occurred in agriculture in Romania and Bulgaria, after 1989, have significantly shaped the development of agricultural advisory services as can be seen from the table below.

Table 1. Evolution of farm advisory services in RO and BG in post socialist period

Period	Romania	Bulgaria
Before 1990	**agricultural advisory services :** - benefited from an top-down approach; - served large cooperatives and state farms (thousands of hectares); - technical-oriented to the detriment of economic -oriented; - agricultural education and research transfer of the more knowledge and research results through the network of agronomists employed by large farms; - large state farms and cooperatives, and in Bulgaria agro-industrial complexes, were important actors of knowledge integration, transfer, generation and innovation;	
1990- 2000	- radical changes in agricultural land ownership and land operation - cooperatives agricultural land was restituted to previous owners; - farmland fragmentation occurs - large numbers of small farms (over 4 million in the RO) and a large number of plots;	
	- rapid deterioration of the production means (irrigation systems, machinery and farm buildings destruction etc.) and removal of a large part of the agricultural specialists from the farm system;	- implementation of land reform lead to three types of farms: small farms run by old farmers, cooperatives - many of them with a precarious financial situation and state farms;
	- most small farmers "were on their own", forced to adopt individual strategies to adapt to new conditions and to use informal channels of information;	
	1998 - the National Agency for Agricultural Consultancy (ANCA) and its regional structures (county and local level) were established within a PHARE Project;	1995 - The National System for Agricultural Consultancy was created with financial and technical support of a PHARE Project.
2001-2007	- in the pre-accession period, public advisory service objectives have become more comprehensive and agricultural consultants attended various training courses and participated in different programs with international technical assistance and funding to meet the needs of farmers in relation to the requirements of the CAP..	
	2001 - ANCA was decentralized and its territorial structures were put under the control of local government; 2005 - territorial structures were centralized under ANCA authority. - consulting services quality was questionable because of institutional instability;	2001 - the National Service for Agricultural Consultancy was established under Ministry of Agriculture;
2007-2013	- National Rural Development Programs (NRDP) entered into force; agricultural advisory services begin to provide assistance in the context of Measure 143 „Providing advice and consultancy for farmers ".They assist farmers for four measures: the establishment of young farmers, subsistence agriculture, creation of	

	producer groups and agro-environmental measures.	
	2009 - ANCA is again reorganized; its territorial structures were transformed in County Agricultural Centers subordinated to county councils; 2010 - ANCA is liquidated. Its tasks are taken by Consulting, Extension and Training Department under the Ministry of Agriculture.	

Source: adapted from Dirimanova, 2013 and Rusu,2013

In time, agricultural knowledge transfer, in the two countries, were organized, managed and provided to farmers through the public consultancy services under the Ministries of Agriculture. Those services have a territorial pyramidal structure: in Romania there are 41 centers at county level (NUTS 3) and 500 local centers at rural level (NUTS5) (Ștefănescu, 2012); in Bulgaria there is a central office in Sofia and 27 regional offices (Dirimanova, 2013). The main objectives targeted by advisory services are to support the implementation of state policy in the agricultural sector for the development of a competitive and efficient agriculture. This service, both in RO and BG, aims to support rural population through vulgarization and technical assistance, support the structural funds accessing, promote associative forms, consultancy, information, professional training etc. The main beneficiaries' public advisory services are farmers and / or rural population.

Besides public advisory services, there is also in RO and BG private agricultural advisory services. Recent years have shown that the consultancy offered by private firms followed an upward trend, particularly in response to the financing opportunities offered by European programs. Farmer organizations are working to improve access to production, marketing and management resources for their members. Farmers play an important role not only as producers but also as contributors to the development of AKIS. Inputs suppliers joint sales of products and knowledge transfer. In general, the cost of the extension service is included in the product price.

2.2. Agricultural research subsystem

Agricultural research is the subsystem that plans, manages and implements activities that develop, evaluate, adapt and test agricultural technologies for farmers. A first group of actors in this subsystem is represented by public research and development institutes that in Romania are subordinated to the Academy of Agricultural and Forestry Sciences "Gheorghe Ionescu-Şişeşti" (ASAS) and in Bulgaria to the Agricultural Academy (AA). These public institutions operate in accordance with their statutes. They are in collaboration with Ministry of Agriculture and Ministry of Education and Research. In Romania, ASAS has under its subordination 17 Agricultural Research and Development Institutes and Centers and 51 Agricultural Experimental Research Centers, located in the country. In Bulgaria operates 25 Regional Scientific Institutes and 21 Experimental Research Centers.

Reform process, started after 1989, has brought many disadvantages to research institutions and centers: chronic underfunding has been a constant in the last two decades; research staff aging; unattractive salaries; blocked jobs; loss of agricultural land due to arbitrary political decisions. There are weak linkages with farmers and in general, research subsystem is not properly coordinated and leads to duplication and dissipation of efforts in the two states. Important volumes of research results are in libraries as publications and they are not accessible to farmers and extension providers.

Along with public research in Romania and Bulgaria, also coexist a small number of independent (private) research suppliers. It may also be noted that several large companies in the agrochemistry, seeds, agricultural machinery, etc, conducts their own research and development.

2.3. Agricultural education subsystem

In the two countries, agricultural education is conducted on the three levels: higher, secondary and vocational education. Throughout the period of transition students number has been a downward trend. University education in Romania and Bulgaria has experienced significant structural changes to adapt to the requirements of the Bologna Process. The networks of agricultural schools and universities have both in RO and in BG a regional structure. Many of these schools have demonstration farms and land for practical activities for educational or experimental purposes. The curricula are generally less adapted to the current situation: it overlooks the fact that current farmers have different needs from those of socialist period.

Theoretically, agricultural universities have a triple roll - teaching, research and consultancy. Most, however, are unable to perform effectively these three roles. They often stay separate from agricultural research and farm advisory because are not under ministries of agriculture and develops predominantly type theory-oriented programs.

CONCLUSIONS

After the change of political regime in 1989, AKIS in RO and BG has gone through significant changes in terms of structural consolidation process, objectives, approaches and actors involved. AKIS bears the mark of recent history: it suffered successive changes to meet the new challenges and realities. In the analyzed period lacked coherent policies that concern all AKIS subsystems and sectoral policies prevailed. In the AKIS, connections between subsystems are relatively weak and there is a visible lack of coordination: each subsystem acts independently and pursues their own agenda. Organizations are unequal as status and, thus, the link operates in a management approach from top to bottom. The participation of farmers in decision-making, thematic prioritization and content is more an aspiration than a reality.

Main subsystems – agricultural research, consultancy and education - are still poorly prepared to support implementation of the Common Agricultural Policy in the two countries. Agricultural advisory, have passed many transformations and adjustments, particularly in Romania. In spite of its generous objectives and targets, this subsystem did not carry them because of insufficient and low paid staff, lacking in many cases, expertise and appropriate training. Moreover, Romania is in a position to restore a new functional farm advisory service.

Agricultural research has been affected in particular by the drop in public funding with insufficient funds for salaries, infrastructure investment and implementation of research programs. The number of researchers dropped and attracting young researchers in this area has remained at stage goal. Loss of researchers' mobility and reduced access to external information leading to decreased quality of research outputs'. In this context, a large number of research institutes are increasingly turning to commercial activities to supplement insufficient budgets to the detriment of agricultural research for farmers.

Agricultural education system also faces difficulties in adapting to the requirements of current agricultural sector. Educational programs, although they have suffered a series of changes, still have a theory-oriented structure: missing modules devoted to farmers' education and training. Both the agricultural universities and colleges' curriculum should be reviewed for graduates who can create jobs rather than to prepare graduates seeking jobs.

Throughout the analyzed period, farmers from both countries were seen as being more end users of agricultural technologies rather than as partners in this process. This is an outdated way of thinking which begins with research that develops new agricultural technologies, and then are disseminated to farmers through extension. You cannot teach people without learning from them and about them (Rolling, 1982). The farmers knowledge and experience and the central role they play in the technology development and transfer should be considered landmarks in agricultural advisory service.

Regardless of the path to be followed in the future, policy makers from RO and BG should not neglect that the agricultural sector progress cannot be achieved without the existence of a performant AKIS. In this regard, it requires policy changes, institutional reorganization, organizations consolidation and capacity building to increase link between AKIS subsystems.

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