

AGRICULTURAL INNOVATION, ADVISORY SERVICES AND NEEDS ASSESSMENT OF THE AGRICULTURAL INNOVATION TRAINING IN THE SLOVAK REPUBLIC

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Abstract

A variety of successful innovations have been introduced in Central European during recent decades. Investments in R&D and agricultural innovations have been fundamental to long-term economic growth worldwide. Recently, substantial shifts in the scientific basis have created a new and promising set of opportunities for innovation in agricultural. Every innovation is a new combination of resources, particularly ideas, skills, information, different types of capabilities, inter-organizational learning and knowledge, and specialized assets. Organizational innovations are as important as product or process innovations. The main actors in AIS in the Slovak Republic are Ministry of Agriculture and Rural Development, Slovak Commerce and Agricultural Chamber, Suppliers and food processors. Investments in R&D and agricultural innovations have been fundamental to long-term economic growth worldwide. However, R & D activities remain weakly supported by the public and private funding in Slovakia. As the result, productivity of the Slovak innovators remains low as well. However, in Slovakia there does not exist any special agency for innovation in agriculture. The tasks of innovation are separated into an agencies and institutions dealing with research and spreading knowledges in agriculture sector. The need for innovation system must become more important in the Slovak Republic in order to facilitate farmer's access to information and knowledges to achieve sustainable

and competitive productivity growth. There are many institutions in Slovakia that have path for innovation in agriculture. But there is a huge absence of advice and innovation for food industry. In the agriculture, cooperation between several different types of actors is seen as key to successful innovation. There is no specific national agreement about integration of knowledge exchange among AIS actors. The whole innovative process is provided by the foreign companies, especially in technological area. The process of innovation in Slovak agriculture is mainly based on workshops, scientific conferences and trainings, which is not enough. The need of change a policy in innovation and advice system is very much required.

Keywords: *Advisory system, Agricultural Innovation System, Broker, Trainings, Innovation capacity, Partnership*

JEL Classification: *O29, O 31, Q19*

1 Introduction

Agricultural innovation system (AIS) should enable to all engaged people in agriculture field to adapt rapidly when changes occur and it should help them to respond well prepared when opportunities arise. Agricultural innovation system indicates a system that links people and institutions to promote mutual learning and generate, share, and utilize agriculture related technology, knowledge and information. The system integrates farmers, agricultural educators, researchers, and advisors to harness knowledge and information from various sources for improved livelihoods. The World Bank (2012) state that the agricultural innovation system approach has evolved from a concept into an entire subdiscipline, with principles of analysis and action; yet no detailed blueprint exists for making agricultural innovation happen at a given time, in given place, for a given result. Speaking about investments in R&D and agricultural innovations have been fundamental to long-term economic growth worldwide. However, R & D activities remain weakly supported by the public and private funding in Slovakia. As the result, productivity of the Slovak innovators remains low as well. However, in Slovakia there does not exist any special agency for innovation in agriculture. The tasks of innovation are separated into an agencies and institutions dealing with research and spreading knowledges in agriculture sector. In Slovakia, there is not establish institution focused on agricultural innovation system. AIS is connected with AKIS and it facilitates farmers to access to information and knowledges to achieve sustainable and competitive productivity growth. In Slovakia. Establishment of the integrated national innovation system should be a key priority for the Slovak government.

2 Data a methodology

The objective of this study is to have a general overview of the agricultural innovation system in Slovakia. In order to achieve the set goals, all data were acquired by a mixed methodology of a semi-structured interview and questionnaire. The framework of this article developed a questionnaire, which was tailored to direct beneficiaries of projects. The sources for research were obtained from primary data. Through the questionnaire survey, we obtained information and data about the need of advisory service and innovation system in Slovakia. Data were gathered through face-to-face interviews. The survey was administered in 2017 and included 20 direct beneficiaries' different regions of Slovakia. The data were classified on the basis of common characteristics: descriptive and numerical.

We decided to use as well methodology of semi-structured interview because of the fact that interviewer is able to follow topical trajectories in the conversation, so it is possible to obtain more data from respondent contrary of the normal questionnaire survey.

The semi-structured interview was preceded by informal observation and un-structured interviewing with the respondent, in order to develop a keen understanding of the topic of interest necessary for developing relevant and meaningful semi-structured questions. In the interview, was used open-ended questions as well as yes-no questions. The inclusion of open-ended questions provides the opportunity for identifying new ways of seeing and understanding the topic at hand. On the other hand, yes- no questions are easier and more quickly to answer and improves consistency of responses. Overall, by using yes-no questions there are fewer irrelevant or confused answers to sensitive questions.

3 Results and discussion

3.1 Innovation and trainings in the Slovak Republic

In accordance with implementation of Cross Compliance in agri-food sector the agricultural innovation and extension services are becoming more important. Alongside of the entirely agricultural services in the FAS in Slovak Republic are involved such activities as renewable energy sources, organic farming, sustainable development of agriculture, forestry and regional development.

The advisory services are in the field of agriculture coordinated by Agroinstitút Nitra and in the field of forestry by IFEE. This task is delegated to the both institutions by MOARD.. The main tasks for coordinating bodies are knowledge sharing, accreditation of advisors and certification of advisory organizations. The

education system related to advisory services compresses mandatory education connected to the elaborated project oriented towards selected field which represents the organic part of the accreditation process and then supplementary education programme of a periodic nature. The second part of the accreditation process is composed of general and technical elements. The education model continues with a course founded on personal communication. The outputs of the advisor's work are evaluated on a reference basis related to quality of provided services, number of prepared and implemented EU projects, and according to other criteria. In total, 27 educational models for advisors have been accredited by the Ministry of Education, Science and Sport. Among the accredited programs, there are for example following models: thematic focus: Environment, Public Health, Crop and Animal Health, Economics, Management and Marketing, Livestock Production and Crop Production etc. In Slovakia after 2007 the accreditation of extension services became more demanding process. In total 131 advisors are registered and 102 advisory agencies are certified which are having first of all the commercial nature. The controlling process of the operation of FAS is ensured by three forms. The first one is connected to evaluation of the annual Green Report's activities of coordinating bodies and collaborating institution. The second level is via Agricultural Paying Agency (APA), through the control of the use of allocated resources for FAS. The third level is monitoring and evaluation of advisory activities by farmers and other beneficiaries of extension services. The evaluation is assessed by coordinating bodies. The quality of the whole system is evaluated according of International quality standard ISO 9001:2015.

3.2 Innovation capacity

Every innovation is a new combination of resources, particularly ideas, skills, information, different types of capabilities, interorganizational learning and knowledge, and specialized assets. According to the World Bank (2012) is innovation the process by which individuals or organizations master and implement the design and production of goods and services that are new to them irrespective of whether they are new to their competitors, their country, or the world. Organizational innovations are as important as product or process innovations.

In meeting of the farmers'/clients' requirements are playing meaningful tasks all research institutions and agricultural institution agencies. Each of them is receiving the required services, process them and provide with advices, formulate the projects/ programmes, prepare the strategies/concepts etc. Public institutions are responsible for their respective field, however there could be potentially and practically overlaps among research institutes and public organizations on one hand and academic institutions on the other hand, since they are managed from

two different Ministries. In addition to this, it is noted the significant upward trend of the services provided by commercial organizations focused on such activities as inputs of seeds, agrochemicals, new technologies, machineries and equipment's, feeds, animal genetic resources, or land reclamation and irrigation.

The coordinating bodies for dissemination of information and announcements are Agroiinstitut Nitra and IFEE for their fields. For this purpose is operated internet portal www.agroporadenstvo.sk. The basic task of Agro portal is organization, processing and distribution of information for the use of agricultural extension and food production. The technical operations and information security are carried out by operator.

The database is providing following information:

- Information about legislation of agricultural extension – focused on the methodological aid to the advisors and clients of agricultural extension services,
- EU legislative information,
- List of accredited organizations/certified advisors,
- Database of the advisory activities of organizations operating in sector about their extension activities and target groups,
- Professional information which are serving to the advisors and beneficiaries of the advisory services, the news from the science and research, new technological procedures, crop cultivation and animal rearing trends,
- Information in the form of articles and publications grouped into individual categories: crop production, animal production, machinery and equipment's, economics, food processing etc.,
- Simple databases systems (machineries, agrochemicals, feeds, medicines etc. with opportunities to obtain the full wording.
- Weather forecast,
- Important role is played by Advisory forum which is the dialog among the users of system on the one side and on the other side with representatives of sector's research institutions, organized during the exhibitions, conferences, field days etc.

Furthermore, important role is paid by Info-terminals in frame of Central Agricultural Advisory System. The mission of the Central Agricultural Extension System is to ensure a qualified and high standard of agricultural extension in Slovakia. Info terminals are working places equipped with computers, which are situated in all regions and some districts of the country. They are accessible to potential users. The info terminals are also furnished with so-called info desks,

equipped with printed materials (leaflets, guidebooks, legislation, information sheets, etc.).

3.3 The role of innovation brokers in knowledge economy

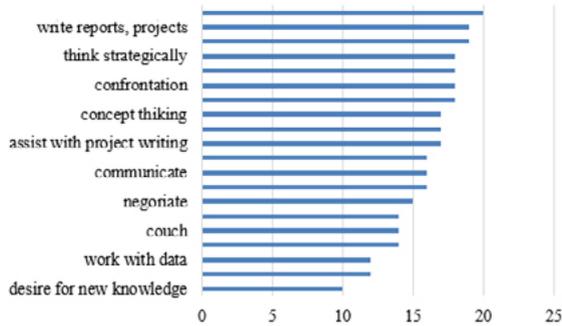
Oettinger, J. - Henton, D. (2013) define brokers as a people working to bring ideas and people together. The value they create is often so intangible as to go unnoticed. They are the ones who seek out connections between people and ideas and foster conversation and interaction. If you see cross-discipline and inter-team work that is producing new ideas and thinking, there is someone playing the role of broker, someone who saw a connection between this and that and took steps to bring people together. The greatest threat to innovation is an information silo. Free and open information exchange and conversation is the fuel that drives innovation in organizations; but all too often, information is walled off in divisions, functional areas, or geographies. Brokers are often somewhat rogue or indifferent to convention and hierarchy. Every innovation takes a risk. It brings good judgment and self-awareness to everything, but understands that there is a point beyond the safe – where there are disproportionate rewards. In any organization, there are plenty of fumbles, missteps and failures.

The role of agro-innovation broker means undertaking following task:

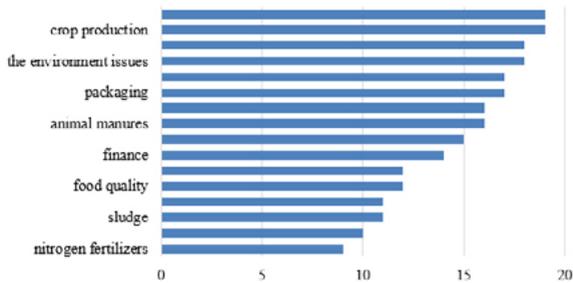
- Good understanding of farming to be able to identify with the client group.
- Supports entrepreneurs to foster a network of open idea flow, capital and services aimed at helping companies innovate
- Being able to persuade farmers to do something to improve their farm business and to take a risk.

3.4 Competence matrix of an Agro-innovation broker

Innovation brokers are valuable because they operate from independent and neutral “third party” position and due to this fact they have to have some special skills. The survey shows that the most important broker skills according to Slovak farmers opinion are the ability to offer proper advice (20 responses), cooperate, network with key farmers, innovators (19 responses) and to write reports and projects. The most important agricultural knowledges are crop production (seeds, pests) (19 responses), writing, managing, implementing projects (19 responses), food quality (18 responses) and economic benefits (20 responses). All the data we can see in Figure 1 and Figure 2, which point to the interpersonal broker skill and agricultural knowledges.

Figure 1 **Interpersonal Broker skills**

Source: Own work based on the questionnaire survey.

Figure 2 **Agricultural knowledge**

Source: Own work based on the questionnaire survey.

Required competences and knowledge of agro-broker according realized research are:

- Understanding of farm management, able to understand in crop and animal production and food safety issues.
- Able to operate in an industry setting, stimulating environment where innovation is a cultural norm, be able to negotiate, communicate and spread the knowledges.
- To have knowledge about factors effecting domestic and international markets, to have information about market prices development.
- Knowledge about project management and be able to react on national and international calls.
- Education in agricultural or agricultural economics.
- Work experience in agricultural advisory system.
- Interpersonal Broker skills are:

- Offer proper advice, be able to listen a real problem and understand a real need.
- Investigate problems, offer proper advice.
- Write reports, projects – for grant purposes.
- Willingness to cooperate in team, negotiate and merge people.

3.5 Needs assessment of the agricultural innovation training in the Slovak Republic

“Innovation is a powerful engine, fuelled by brokers, role models and risk-takers.”

Warren Zevon

The term “Innovation” is according to Tamáš -Kopta- Zdráhal (2017) very broad, can therefore be combined with: a new and improved products, techniques or technologies, processes or even their adjustment to new, e.g. environmental requirements. Novelty is considered as an innovation only when it becomes commonly applied in a given field and when it brings substantive effects.

In a knowledge society the innovation system supports its businesses and entrepreneurs by fostering a network of open idea flow, capital and services aimed at helping companies innovate and get ideas off the ground.

What is the role and why are innovative brokers in agriculture important in Slovakia?

Brokers are working to bring ideas and people together. The value they create is often so intangible as to go unnoticed. They are the ones who seek out connections between people and ideas and foster conversation and interaction. If you see cross-discipline and inter-team work that is producing new ideas and thinking, there is someone playing the role of broker, someone who saw a connection between this and that and took steps to bring people together. The greatest threat to innovation is an information silo. Free and open information exchange and conversation is the fuel that drives innovation in organizations; but all too often, information is walled off in divisions, functional areas, or geographies. Brokers are often somewhat rogue or indifferent to convention and hierarchy. Every innovation takes a risk. It brings good judgment and self-awareness to everything, but understands that there is a point beyond the safe – where there are disproportionate rewards. In any organization, there are plenty of fumbles, missteps and failures.

In the Figure 3 we can see current situation of agricultural innovation training in the Slovak Republic, which has its own strength and weakness as well. The matrix is divided into three categories – Innovation and training, Innovation capacity and Innovation partnerships.

Figure 3 Agricultural innovation training situation in the Slovak Republic

	Innovation and training	Innovation capacity	Innovation and partnerships
Strength	<ul style="list-style-type: none"> - The advisory services on the regional, i.e. direct level - Special training courses, conferences, seminars, projects. - Struggling to improve the position of farmers in society - Negotiation struggling to improve the position of the food industry. - Negotiation with business chains- store declares interest in Slovak products. 	<ul style="list-style-type: none"> - Farmers have enough possibilities to cooperate as well various fund options, from several programs offered by EU. 	<ul style="list-style-type: none"> - Activities are realized by activities in the whole territory in whole Slovakia.
Weakness	<ul style="list-style-type: none"> - Insufficient networking between the research and practices. More activity in the intensive use of innovation. - Limited training opportunities on appropriable level 	<ul style="list-style-type: none"> - Belief that the agricultural innovation system in Slovakia exist, but not in organized and state-aided form. - Intensify the information dissemination targeting at agricultural innovations and as well as the latest knowledge of science and research. - Encourage farmers to more intensive use of innovations. - On the one hand farmers have the capacity and potential to adopt innovation but on the other hand there are not that active in searching information about possibilities of active support from EU. 	<ul style="list-style-type: none"> - Networks and collaboration are difficult to establish, but it is very important to do it. - Necessary to generate research tasks directly based on the demand of farmers. - Transfer results of research directly into practice. - The cooperation is not extended in the agricultural area.

Source: Own work based on the questionnaire survey.

4 Conclusion

Agricultural innovation system indicates a system that links people and institutions to promote mutual learning and generate, share, and utilize agriculture related technology, knowledge and information. The system integrates farmers, agricultural educators, researchers, and advisors to harness knowledge and information from various sources for improved livelihoods.

As it is visible from research below, in Slovakia many institutions have path for innovation in agriculture. But there is a huge absence of advice and innovation for food industry. The whole innovative process is provided by the foreign companies, especially in technological area. The process of innovation in Slovak agriculture is mainly based on workshops, scientific conferences and trainings, which is not enough. The need of change a policy in innovation and advice system is very much required.

One of these changes could be “innovations broker”, who will bring ideas and people in agriculture together. In general innovation broker should offer a fresh look at diagnosing the constraints and opportunities of farmers or, at a higher level, production chains, regions, or sub-sectors. Due to their critical approach, brokers tend to force their clients to look for possibilities beyond their current situation and constraints. The question is if the Innovation Brokers are the answer how to change current situation in the agriculture? We agree with Klerkx et al. 2009, who said that in many countries network building and facilitation for agricultural innovation is seen as principal challenge and thus innovation brokers may be a valuable new type of actor in the agricultural knowledge infrastructure and the agricultural innovation system. Innovation brokers are valuable because they operate from independent and neutral “third party” position as regards the problems and challenges they address, the partners to involved and their interest during the innovation process.

References

1. EC-SCAR. (2012). Agricultural Knowledge and Innovation Systems in Transition - A reflection paper. Standing Committee on Agricultural Research - Collaborative Working Group on Agricultural Knowledge and Innovation System (CWG AKIS). Brussels: European Commission.
2. HOFFMANN, V., PROBST, K., CHRISTINCK, A. (2007). Farmers and researchers: How can collaborative advantages be created in participatory research and technology development? *Agriculture and Human Values*, 24, p. 355-368. <http://dx.doi.org/10.1007/s10460-007-9072-2>

3. KADLEČÍKOVÁ, M., FILO, M., KAPSDORFEROVÁ, Z., FARKAŠOVÁ, L. (2013). The changing priorities of the agricultural and rural development sectors under the changing conditions of the common agricultural policy of the EU. In *Business management - practice and theory in the 21st century: international scientific conference: proceedings of scientific papers*, June 6-7, 2013, Nitra, p. 77-84. ISBN 978-80-552-1026-1.
4. KAPSDORFEROVÁ, Z., KADLEČÍKOVÁ, M. (2014). AKIS and advisory services in Slovakia. Report for the AKIS inventory (WP3) of the PRO AKIS project, April 2014.
5. KLERKX, L. (2009). Strengthening Agricultural Innovation Capacity: Are Innovation Brokers the Answer? In: *International Journal of Agricultural Resources, Governance and Ecology* 8 (2009)5/6. p. 409-438. ISSN 1462-4605
6. OETTINGER, J., HENTON, D. (2013). The role of innovation brokers in a knowledge economy. Triple Helix XI International Conference, London, July 2013, Collaborative Economics 520 pg. S. El Camino Real, Suite 710 San Mateo, CA 94022 P 650.235.8323.
7. TAMÁŠ, V., KOPTA, T., ZDRÁHAL, I. (2017). Situation analysis of agricultural innovation services in Czech Republic In: Situation analysis of agricultural innovation services in Europe. Gödöllő: Szent István University, 2017. p. 105-131. ISBN 978-963-269-696-6.
8. The World Bank. (2012). *Agricultural innovation systems an investment source-book*. The World Bank, 2012, 680 p. ISBN 978-0-8213-8684-2