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Innovative potential of the agricultural sector of Russia and its prospects in conditions of the Eurasian Economic Union

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Abstract. The paper reviews key approaches to studying agricultural innovations with the purpose of identifying its drivers at both macro- and microlevels. Acknowledging the importance of the development of Russia's agricultural sector in conditions of country's membership in the Eurasian Economic Union, the paper stresses the need to quantitatively evaluate the innovative potential Russia has as an independent state and a member of the regional economic union. In order to address the aforementioned research tasks, the paper, first of all, provides a literature review on drivers of agricultural innovation, including research, education, institutional environment, etc. Then, the concept of an agricultural innovation index is discussed in the second part of the paper, including possible ways of its operationalization.

1. Introduction

In conditions of the rapidly changing environment in the agricultural sector, it is highly important for the actors working in this part of the national economy to fully understand the need and significance of agricultural innovation, as well as to find appropriate tools for its stimulation. However, any effective policies and measures aimed at increasing agricultural innovation should be deeply based in theoretical and empirical scientific knowledge. Such knowledge needs to give insights into main drivers of agricultural innovations, as well as its measurement and better understanding.

The issue of agricultural innovation is very important for Russia's agricultural sector for a number of reasons. Been seen as part of the larger national innovative complex, the agricultural sector of Russia lags behind in a number of innovative indicators if compared to the EU, USA, or China [2, 4, 7]. Therefore, it is of the highest importance to conduct an in-depth study of the innovative potential the national agricultural sector has in the context of Russia's ambitious plans to build an innovative economy and improve its technological development. In the context of the integration processes taking place between the countries of the Commonwealth of Independent States (CIS), particularly between Russia, Kazakhstan, and Belarus, as well as the goal to build a common market of agricultural products, the innovative development of the common agricultural sector in these three diverse countries is also another challenge to be addressed.

The paper aims to review main approaches to studying agricultural innovations with the purpose of identifying its drivers at both macro- and microlevels. Also, given the importance of the development of Russia's agricultural sector, especially in conditions of country's membership in the Eurasian Economic Union, there is a need to quantitatively evaluate the innovative potential Russia has as an



independent state and a member of the regional economic union. In order to address the aforementioned research tasks, the paper, first of all, provides with a literature review on drivers of agricultural innovation, including research, education, institutional environment, etc. Then, the concept of an agricultural innovation index is discussed in the second part of the paper, including possible ways of its operationalization.

2. Drivers of Agricultural Innovation: a Literature Review

Being one of the most important factors increasing the productivity, competitiveness, and profitability in the agricultural sector, innovation is a complex concept that encompasses a number of layers in technological, social, economic, psychological, and other dimensions. Traditionally, scholars distinguish between the two poles of innovation: technological and non-technological [1, 2]. Technological innovation relates to products and processes, while non-technological innovation falls within organization and marketing. Despite the elegance of the “technological/non-technological” construction, this distinction does not take into account the simple fact that there are various activities organizations in all sectors of the economy (and in agriculture particularly) perform a set of innovation activities, which can be considered as modes of innovation.

The literature clearly demonstrates that there are significant differences in agricultural innovation across various countries [3, 4] and regions [5]. The main factors of such differences might be the following: (a) the varying effectiveness of the policies being implemented on federal and regional levels; (b) institutional settings; (c) infrastructural environments; (d) knowledge transfer systems; (e) regional dynamics that affect innovation efforts, etc. [11]. More than that, the literature also demonstrate that agricultural innovation may be facilitated or constrained by a number of factors. For instance, the paper [6] states that innovative performance might be largely influenced by demographic structures and existing agricultural systems. The geographical proximity also have impact on innovations, as suggested by [7]. Additionally, the paper [8] questions that the geographical proximity is the key factor of influence on agricultural innovations and suggests that other dimensions of proximity are also very relevant.

Another body of literature focuses on the role of institutions in driving changes in the agricultural sector. In particular, it is believed that institutional settings are central in shaping innovation processes focused on the shaping and interaction of knowledge. Institutions are seen, in this perspective, as the sets of common habits, practices, routines, rules or laws that regulate the relationships and interactions between individuals and groups [9]. Consequently, an environment being the result of institutions is very important in supporting and encouraging innovation. Also, some scholars suggest that stakeholders’ demands are to be met and they are to be involved in creating and supporting agricultural innovation. Stakeholders’ demands shape the focus and direction of innovations [10].

Until recently, the development and diffusion of agricultural innovations was seen as a linear process involving public sector research and extension organizations, which implicitly assumes that innovation is a product of research [11]. However, agricultural innovation is increasingly seen as a process that involves the input of various actors and also as something that also depends on the social structure of the specific context [12]. That is, agricultural innovation evolves as a result of interactions between different actors, such as farming systems, supply chains and economic systems, policy environments, extension and societal systems, which reflects the idea of Agricultural Innovation Systems (AIS) [13]. This emerging approach provides a much broader perspective than the linear approach to innovation. Generally, an innovation system can be defined as: “a network of organizations, enterprises, and individuals focused on bringing new products, new processes and new forms of organizations into social and economic use, together with the institutions and policies that affect their behavior and performance” [14]. It becomes clear that the impact of a collaborative process that leads to innovation is increasingly recognized, which discards the linear approach to innovation as an almost simplistic way [12].

3. Assessing Agricultural Innovation: Towards A Research Design

In order to capture such a broad concept as agricultural innovation, taking into perspectives on national and subnational levels, we propose to develop an agricultural innovation index. Combining a broad variety of different innovations into a measurable index provides a challenge. Hence, guided by the literature, a number of innovation indicators that are relevant for the agricultural sector are selected from the available data. That is, our innovation index is a composite index based on indicators relating to (1) innovation adoption, (2) acquisition of knowledge, and (3) continuous innovation. The idea behind this composite index is an attempt to capture and reflect the complexity of agricultural innovation. Moreover, agricultural innovation is driven by the actions of farmers, therefore it is seen as important to consider their innovation efforts.

In addition to the literature review, the input of six knowledge transfer and innovation experts can be used to select appropriate indicators and to provide guidance in determining their relative ‘weight’ in terms of innovation effort. To capture the idea of an innovation system and in recognition that different stakeholders in the system may perceive innovation differently, the knowledge transfer and innovation experts can be selected from different components of the overall innovation system, including research, education, agribusiness and advisory services. This is especially relevant in order to capture regional processes and peculiarities.

In relation to the indicator measuring innovation adoption, five technologies and farm practices may be selected for each of the main farm systems which operate in Russia and other EAUE countries: dairy, cattle, sheep, arable and mixed livestock.

Four technologies are common to all systems, while one technology is specific to each sector. The selection of technologies is to be dictated by data availability. Therefore, care should be taken to choose appropriate technologies for all farm systems. In order to overcome data limitations and especially the drawback that some technologies are available for longer than others, expert opinions can be used to give each technology a weight.

The second indicator measures acquisition of knowledge and is assessed by a proxy for whether or not an economic actor consults advisory services for non-scheme related matters. This is an attempt to take into account the fact that knowledge development is paramount for innovation [3, 14]. The paper [15], for example, describes knowledge development and diffusion as the heart of the innovation system, which has important implications for the adoption of practices. Moreover, extension and advisory services are seen as integral to the facilitation of innovation in general and technology adoption in particular.

The third indicator measures continuous innovation and is represented by a variable indicating whether or not the economic agent has renewed some machinery during the year. This measure serves as a proxy for the continuous nature of innovation as renewal of machinery is seen as important for innovation.

4. Conclusions

The article discusses the main approaches to the study of innovations in the field of agriculture from the point of view of their use for the analysis of innovative processes taking place in Russia and the countries of the Eurasian Economic Union. Particular attention is emphasized to the study of growth drivers. It is also proposed to use the index of agricultural innovation, including how it is used to analyze the processes taking place in Russia and the countries of the Eurasian Economic Union.

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