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**THEORETICAL AND METHODOLOGICAL APPROACHES TO
INNOVATIVE POTENTIAL OF THE AGRICULTURAL AND FOOD
SECTOR IN ECONOMY**

The rate of innovations in agricultural sector largely depends on its innovative potential. Agricultural and food sector in Ukraine (AFS) is a large part of Ukrainian economy, including agriculture, food industry and trade in food, which are combined to ensure the country's food security and social and economic development of agricultural sector workers in rural areas.

Different approaches to the definition of the concept "potential" and "innovative potential" are represented in scientific abstracts. Hence, potential is:

- firstly, the physical parameter characterizing the force field at a given point; secondly, the degree of power in any respect, the totality of means needed for something [13, p. 493];

- an indicator which, on the one hand, characterizes the state of an object (system) and, on the other hand, a category that simultaneously reflects the essence of methodological foundations of some real processes and phenomena [10];

- in Latin language it means "power"; power characteristic of a certain physical field (used in physics); a set of available sources, means and capabilities for performing certain tasks [7];

- the value that characterizes energy reserve of a body that is located at a particular point of the force field [8].

There is a variety of definitions not only due to multifunctionality of this term, but also to the fact that this term is often used to describe either global or narrow issues in the study of individual components of innovation potential.

It is important to group together and analyze a large number of potential system components in order to ensure consistency of the complex set of different elements.

A general interpretation of this term is universal and makes it possible to be applied in various fields of scientific and human activity. "Country potential", "military potential", "natural and economic potential" are interpreted as a set of economic, military, moral and political resources that can be used by the state for warfare or as a combination of economic opportunities of the state (or the union of states), which can be used to provide all needs (production, defence, personal needs, etc.) or as a combination of natural factors and resources that can be used to achieve certain goals [7, p. 7].

This precise approach makes it possible to accurately reflect not only different situations or relationships, but also particular processes and trends in their development and, thus, the efficiency of an economic system in general [10].

Scientific analysis showed that scientists do not have a single point of view regarding the essence of the concept of "innovative potential". Let's consider innovative potential with complex and systemic approaches. According to the systemic approach, innovative potential is an integral part of a company's potential and it represents a coherent dynamic social economic system. According to the integral approach, innovative potential is a complex structure consisting of a set of interacting elements of varying degrees of complexity and organization [16].

Innovative potential of social and economic system is characterized as a set of sources, opportunities, means, and experiences that can be used to achieve a definite goal of innovation development [15, p. 192].

While considering the typology and classification of innovation potential of an economic system, a scientist tries to combine some definitions of innovation capacity

in a single concept: innovative potential, on the one hand, is a part of scientific and technical potential and, on the other hand, is a part of economic potential that requires particular characteristics that are homogenous with these systems. A researcher believes that the country's innovative potential creates objective prerequisites for innovation and the functioning of the economic system in a more qualitative way [5].

However, it is also supposed that innovative potential is the readiness and susceptibility of a society, national economy, industry, or region to innovations taking into account scientific, technical, industrial, labour, material and other opportunities [11].

Exploring innovative potential of a national economy, a scientist may conclude that the concept of "innovative potential" should be understood, on the one hand, by a set of financial, material, and labour resources that are required for the implementation of innovations, and, on the other hand, a set of results achieved by scientific and innovative activities [17].

According to one dictionary [14, p. 131] "innovative potential" is defined as the ability of various sectors of a national economy to produce knowledge-intensive products that meet the requirements of the world market.

Since the essence of the concept "innovation potential" has a very wide range of definitions, there is a need to streamline them at different levels of the economy.

Thus, the analysis of different approaches to the interpretation of the term shows these approaches are quite different. Hence, some authors focus on the availability of resources, and others - on the possibilities of their use.

The concept "innovative potential" should be considered at different levels: at micro level - the level of enterprises; at meso-level - regional level; at macro level - level of a national economy and its industries.

In particular, macro level is represented by agricultural and food sector as a set of industries of a national economy, which provide production and sale of food products.

Analysing different interpretations of the concept "innovation potential" it is expedient to highlight the following approaches to its definition:

- as a part of scientific, technical and economic potential;
- as a set of resources required for the implementation of innovations;
- as an ability to produce science-intensive products;
- as a set of results of scientific and innovative activity;
- as a readiness and susceptibility to innovations.

To understand the essence of innovation potential it is important to find out the approaches of researchers to the term "innovative potential of an industry". Hence, innovative potential of an industry:

- is the ability of an industry to develop in a more qualitative way, where a significant role is played by the theory of the duration of "business cycles" and changes in technological paradigms of an economic system [9, p. 15];

- is characterized by the ability of an industry to develop in accordance with the changes in technological paradigms of an economic system [4].

Based on the fact that AFS represents a combination of industries, it is appropriate to consider the innovative potential of this sector:

- as a set of innovative resources of various branches in the sphere;
- as a part of its scientific and economic potential, where science-intensive products are manufactured;
- as a result of scientific and innovative activities, susceptible to innovations of business entities, which can lead to innovative more qualitative development during the change of technological paradigms of a national economy.

The AFS innovation potential structure can be represented as follows (Fig. 1).

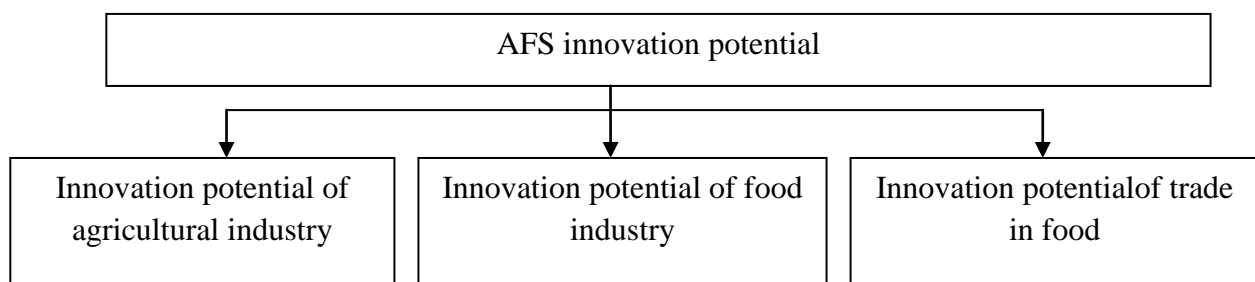


Fig. 1. AFS innovation potential structure (created by the authors).

There are several peculiarities of AFS innovation potential. Firstly, AFS innovation potential is partly formed beyond its borders. In particular, research institutions and universities carry out researches in biological and technical sciences, which are subsequently used to create new varieties of agricultural plants, breeds of farm animals and poultry, food technologies, technical means for the production and processing of agricultural raw materials, and trade in food.

Secondly, technical potential of agriculture and food sector is also formed outside the agricultural sector: the development and production of technical equipment for industries is carried out by research institutions and companies specialized in tractor and agricultural engineering, enterprises producing equipment for food industry and trade.

Thirdly, in market conditions, a food consumer raises increased demands for the variety and quality of food products. Therefore, domestic food industry, in order to compete with foreign producers, is forced to formulate a relevant commodity innovation policy, to influence agriculture as a supplier of food raw materials.

In addition, the development of AFS innovation potential should be made taking into account its significance as the most important component of a country's economy, which should ensure food security.

It is determined that the issues of methodology for determining the rate of agriculture sector innovation potential, particularly, the choice of indicators, are not studied sufficiently. Scientific and innovative potential of territorial entities and industries consists of indicators of leading organizations and enterprises, whose potential, in turn, is characterized by a hierarchical system indices of three groups: scientific data; data on innovations; and data regarding the influence of science and innovations on economic growth [12].

Indicators of innovative development of economic systems can be divided into three groups: indicators of research in resources while conducting innovation activities; indicators of investing in innovative processes; and indicators for assessing the effectiveness of innovation activities [3]. The analysis of existing methods made

it possible to identify problems in assessing innovation potential that are inherent to economic systems of all levels: the assessment of the innovative potential of an economic system is usually retrospective; comprehensive assessment of innovation potential is reduced only to the sum total of potential components; insufficient application of scientifically substantiated economic and mathematical models and calculation methods [2].

As a result of analysis in the use of methodological approaches to the assessment of innovation potential, it has been proven that the use of most methods for assessing innovation potential in an industry is impossible due to the lack of information or indicators required for evaluation. Therefore, it is necessary to develop a methodology for assessing innovation potential of an economic sector, which would make it possible to assess the potential within existing social data [1].

The final choice of indicators will depend on the choice of the object under study (national economy, economic region, industry or a separate enterprise) and the innovative potential in terms of its use [18].

It is proven that existing methods cannot be used to accurately determine the rate of innovation potential in a particular sphere.

A methodological approach to assess the innovation potential of this sector has been developed by the authors [6]. This method involves inventory of the amount of innovative resources, as well as the possibility of practical implementation of innovation potential in the sector. The approach mentioned above is based on the assumption that the level of innovation potential of the agricultural sector is characterized by the availability of innovative resources, the use of which can result in the production of a certain amount of relevant products on an innovative basis.

Agricultural and food sector innovation potential (AFS) of a national economy is a combination of state resources that provide innovative development of the components of AFS (agriculture, food industry, trade in food).

AFS innovation potential in a particular industry can be determined with a formula (1) [6]:

$$IP_{bAFS} = \sum_{i=1}^n IR_i \times P_i, \quad (1)$$

where IP_{bAFS} is AFS innovation potential in a particular industry;

IR_i – the amount of i^{th} innovation resource;

i – the type of innovation resource;

n – the number of types of innovation resources;

P_i – production (in value terms) per one unit of i^{th} innovation resource.

Specific values of the innovation potential that can be calculated in accordance with formula (1) and could subsequently become the basis for the formation of normative values P_i , can be obtained using economic and mathematical methods.

AFS innovation potential in a particular industry characterizes the upper limit of production growth by maximizing the return on innovative resources. The rate of AFS innovation potential in general (IP_{AFS}) is characterized by the following correspondence (2):

$$IP_{AFS} = K_1 IP_a + K_2 IP_{fi} + K_3 IP_{ft}, \quad (2)$$

where, IP_{AFS} is the rate of AFS innovation potential;

IP_a , IP_{fi} , IP_{ft} – innovation potential in agriculture, food industry, and trade in food respectively;

K_1 , K_2 , K_3 – coefficients of actual development of innovation potential in accordance with agriculture, processing industry (food production), and trade in food respectively.

It can be assumed that the values of the coefficients K_1 , K_2 , K_3 are within $0 \leq K \leq 1$ and characterize the ability of the AFS corresponding branch to use innovative resources.

The values of these coefficients can be determined using the expert estimation method. The following scale have been developed by the authors and is advised to be used for interpreting calculations:

- very high rate of innovative resources use – 0,9-1,0;
- high rate of innovative resources use – 0,7-0,8;
- average rate of innovative resources use – 0,5-0,6;
- low rate of innovative resources use – 0,3-0,4;
- very low rate of innovative resources use – 0,1-0,2.

Successful innovative development is the key to the power of any country. An insufficient rate of innovation development leads to technological, scientific and social backwardness of a country. The innovative model of economic development is universal. Ukrainian scientists demonstrate a high level of scientific research and the ability to create unique scientific and technological developments, which are not inferior to those created worldwide.

An assessment of innovation potential is a necessary component for the development of innovation strategy. In particular, if there are all the necessary resources and capacities that allow the development and implementation of innovations, it is then worth applying leadership strategies. If the innovation capabilities are limited, it is then advisable to apply the strategy of inheritance.

Thus, while studying the peculiarities of innovative activity of the agricultural sector, the hypothesis of the study was obtained, which was confirmed by the following:

1) there are specific features inherent to the innovation activity of AFS. These features arise due to the peculiarities of industrial and commercial activity inherent to certain branches which influence the typology of innovations. The possibility to classify innovations in the AFS is substantiated taking into account: a) common scientific methodological approaches to the development of society; b) functional approaches to the AFS; c) the AFS structure as the most important sphere of the economy;

2) expediency of researching innovative potential at micro level (enterprises), meso level (region), and macro level (national economy, economic sectors, and interconnected in sectors in a particular industry of an economy). In particular, macro

level is represented by agricultural sector as a set of economic sectors, which provide the production and sale of food products;

3) definition of the innovative potential of the agricultural sector: as a set of innovative resources of sector branches; as a part of scientific and economic potential, capable of producing science-intensive products; as a result of scientific and innovative activity of economic entities that are susceptible to innovations and innovative development on a more qualitative basis in terms of the changes in technological paradigms of a national economy. It is assumed that the development of innovative potential in agricultural sector should be implemented taking into account to ensure the country's food security;

4) innovative potential in agricultural sector is formed due to domestic innovative resources of agriculture, processing industry (food production) and trade, as well as external innovative resources of scientific potential at scientific research institutions and universities that conduct researches in biology and technologies, which are later used to create new varieties of agricultural plants, breeds of farm animals and birds, food technologies, technological means for production and processing agricultural raw materials, and trade in food;

5) the need to improve methodological approaches to determine the rate of innovation potential in agricultural sector. The approaches, proposed by the authors, are based on the inventory of the amount of innovative resources, as well as the possibility of practical implementation of innovation potential in the sector through the use of expert estimation method.

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