ІЛЕУМЕТТІК – ГУМАНИТАРЛЫҚ ҒЫЛЫМДАР / СОЦИАЛЬНО – ГУМАНИТАРНЫЕ НАУКИ / SOCIAL AND HUMAN SCIENCES

UDK 330:001.83
SCSTI 06.01.17

TO THE QUESTION ABOUT USE OF OECD STANDARDS IN THE SCIENTIFIC – TECHNOLOGICAL DEVELOPMENT OF AGRO – INDUSTRIAL COMPLEX IN KAZAKHSTAN

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К ВОПРОСУ ОБ ИСПОЛЬЗОВАНИИ СТАНДАРТОВ ОЭСР В НАУЧНО – ТЕХНОЛОГИЧЕСКОМ РАЗВИТИИ АГРОПРОМЫШЛЕННОГО СЕКТОРА В КАЗАХСТАНЕ

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ҚАЗАҚСТАНДА АГРО – ӨНДІРІСТІК КЕШЕННІҢ ҒЫЛЫМИ – ТЕХНОЛОГИЯЛЫҚ ДАМУЫНДАҒЫ ЭЫДҰ СТАНДАРТТАРЫН ПАЙДАЛАНУ МӘСЕЛЕЛЕРІ ТУРАЛЫ

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Annotation

The article presents some issues on the application of OECD standards (Organization for Economic Cooperation and Development, France, Paris) within the framework of scientific and technological development of the agro – industrial complex in the Republic of Kazakhstan. Particular emphasis is placed on the recommendations of the President of the country N. Nazarbayev on the need to introduce and further apply the OECD standards in Kazakhstan. Various points of view of modern domestic researchers are presented with regard to the innovative development of the agro – industrial complex in the country. The statistical information reflecting the current state of the scientific and technological sphere of the Republic of Kazakhstan is analyzed. At the same time, special attention is paid to indicators characterizing the innovative development of the country's agricultural sector. Among them, GDP, intramural research and development (R&D) expenditures, the ratio of the level of intramural R&D expenditures to GDP. In conclusion, author's recommendations are given, the implementation of which will increase the innovative potential of the agro – industrial complex of the Republic of Kazakhstan.

Key words: Intramural R&D expenditures, OECD, GDP, applied, experimental and basic researches.

Аннотация

В статье представлены некоторые вопросы применения стандартов ОЭСР (Организация экономического сотрудничества и развития, Франция, Париж) в рамках научно – технологического развития агропромышленного комплекса (АПК) в Республике Казахстан. Особый акцент сделан на

рекомендациях Президента страны Н. Назарбаева о необходимости внедрения и дальнейшего применения стандартов ОЭСР в Казахстане. Представлены различные точки зрения современных отечественных исследователей в отношении инновационного развития АПК в нашей стране. Проанализирована статистическая информация, отражающая текущее состояние научно – технологической сферы Республики Казахстан. При этом особое внимание уделено индикаторам, характеризующим инновационное развитие сельскохозяйственной отрасли страны. Среди них ВВП, внутренние затраты на проведение научно – исследовательских и опытно – конструкторских работ (НИОКР), отношение уровня внутренних затрат на проведение НИОКР к ВВП. В заключении даны авторские рекомендации, реализация которых позволит повысить инновационный потенциал АПК Республики Казахстан.

Ключевые слова: Внутренние затраты на научно – исследовательские и опытно – конструкторские работы, ОЭСР, ВВП, прикладные, экспериментальные и фундаментальные исследования.

Аңдатпа

Мақалада Қазақстан Республикасының агроөнеркәсіптік кешенінің ғылыми – технологиялық дамуы шеңберінде ЭЫДҰ стандарттарын (Экономикалық ынтымақтастық және даму ұйымы, Франция, Париж) қолдану туралы кейбір мәселелер қарастырылған. Ел Президенті Н.Назарбаевтың Қазақстандағы ЭЫДҰ стандарттарын енгізу және одан әрі қолдану қажеттілігі туралы ұсыныстарына айрықша көңіл бөлінеді. Біздің еліміздегі агроөнеркәсіптік кешеннің инновациялық дамуына қатысты заманауи отандық зерттеушілердің әртүрлі көзқарастары ұсынылған. Қазақстан Республикасының ғылыми – техникалық саласының ағымдағы жағдайын көрсететін статистикалық ақпарат талданады. Сонымен бірге еліміздің аграрлық секторының инновациялық дамуын сипаттайтын көрсеткіштерге ерекше көңіл бөлінеді. Олардың ішінде ЖІӨ, зерттеулер мен әзірлемелердің ішкі шығындары (ҒЗТКЖ), ҒЗТКЖ ішкі шығындарының ІЖӨ – ге қатынасы. Қорытындылай келе, Қазақстан Республикасының агроөнеркәсіптік кешенінің инновациялық әлеуетін арттыратын авторлық ұсыныстар берілген.

Түйінді сөздер: Ғылыми – зерттеу және тәжірибелі – конструкторлық жұмыстарға ішкі шығындар, ЭЫДҰ, ІЖӨ, қолданбалы , эксперименттік және негізгі зерттеулер.

Introduction

In the modern socio – economic conditions the economic development of any country primarily depends on the investments to Research and Development (hereinafter R&D) Projects, the creation of new technologies and the application (commercialization) of already existing innovations.

Today the innovative leadership is largely determined by the level of socio – economic development, as well as the quality of life of the population.

The development and further prosperity of the Republic of Kazakhstan primarily depends on knowledge acquired by people during all life. Knowledge is the basis for new ideas and solutions. Its implementation should contribute to the provision of the sustainable development of our country.

Under today's conditions of global market competition namely new knowledge should contribute to the development of innovations which are the source of creation of the new products and services.

We believe that Kazakhstan needs to find its own niche and take a decent position in the global competitive R&D market.

President of the Republic of Kazakhstan N.A. Nazarbayev constantly talks about it in his speeches. He notes the importance of the growth of scientific, technological and industrial – innovative development.

For example, speaking with the Address «Kazakhstan's way – 2050: common aim, common interests, common future» to the people of Kazakhstan on the 17th of January 2014, President says: «The development of new high – tech sectors of the economy will require increase in financing of science to the minimum level of 3 percent of GDP» [1].

At the same time the Head of the State pays special attention to the implementation of the OECD (Organization of the Economic Cooperation and Development, France, Paris) standards in the Republic of Kazakhstan.

In particular, the President says: "Today the member states of the Organization for Economic Cooperation and Development (OECD) represent basic indicators of developed countries. This organization brings together 34 countries that produce more than 60 percent of global GDP. There are six more candidates to join the OECD: Brazil, China, India, Indonesia, Russia and South Africa. The OECD member countries have undergone the path of deep modernization. They now demonstrate high rates of investment, scientific research, productivity, a large share of small and medium – sized businesses, and high standards of living. These indicators of OECD countries provide a natural benchmark for Kazakhstan on our way to joining the top 30 developed nations of the world.

I set the task to introduce in Kazakhstan a number of principles and standards of the OECD. They are reflected in the draft Plan. In our economy, we plan to reach annual GDP growth not less than four percent. We should increase the volume of investment from the current 18 percent of the country's GDP to 30 percent. The development of knowledge – based economy aims to see the share of non – oil products in Kazakhstan's export potential rise to 70 percent [1].

Considering the stimulating methods for business to invest in innovations and R&D projects, we can say that today there is no single and unified approach that would fully guarantee the successful development and effective implementation of scientific – technological policy in the country, striving to reach the 3 percentage level of intramural R&D expenditures' level to GDP. Every state has its own way of development, which has its own peculiarities, national traditions, customs, etc.

Current situation and analysis of the main scientific – technological indicators in the Republic of Kazakhstan.

As a rule, in economic analysis the researchers talk about innovative leadership of the state based on the ratio of intramural R&D expenditures to GDP.

In accordance with the data of the table 1 the meaning of GDP in Kazakhstan in 2016 was 46 971,2 bln. tenge, which is 6 087,1 bln. tenge (or 14,9%) more than in 2015 and is 7 295,4 bln. tenge (or 18,4 %) more than in 2014.

The amount of intramural R&D expenditures in 2016 was 66 600,1 mln. tenge which is 2 702,8 mln. tenge (or 3,9 %) less than in 2015 and 252,5 mln. tenge (or 0,4 %) more than in 2014.

The level of intramural R&D expenditures to GDP in 2016 was 0,14 % which is 0,03 % less than in 2014 and 2015.

Table 1 Main indicators of the state and development of science in Kazakhstan

Indicator	2014	2015	2016
Gross Domestic Product (GDP), bln. Tenge	39 675,8	40 884,1	46 971,2
Intramural R&D expenditures, mln. Tenge	66 347,6	69 302,9	66 600,1
Ratio of intramural R&D expenditures to GDP, in %	0,17	0,17	0,14
Amount of R&D entities, units	392	390	383
Amount of R&D workers, in people	25 793	24 735	22 985

in them			
Researchers	18 930	18 454	17 421
in them			
doctors of sciences	2 006	1 821	1 828
PhDs	330	431	456
candidate of sciences	5 254	5 119	4 726
Doctors on the profile	596	549	493
Average monthly nominal salary of the employed people by the types of economic activity, tenge			
Research and development	171 626	184 940	208 752
High Education	117 985	125 944	136 403
Investments in fixed assets, mln. tenge			
Research and development	9 321,7	11 169,6	11 528,8
High Education	44 180,2	40 530,1	56 176,5

Source: [2]. The intramural R&D expenditures' level (percentage of GDP) characterizes the level of innovative – technological development of any country.

In this connection, the actual state task in Kazakhstan is in the search and following complex development of the program and implementation of activities aimed at the providing the permanent growth and achievement of 3 percentage level of the intramural R&D expenditures' level to GDP by 2050.

The maximal amount of intramural R&D expenditures in 2016 was carried out in the «Engineering research and technologies» scientific point. Its meaning here in 2016 was 30 193,4 mln. tenge (or 45,3 % from total amount, see table 2).

In the «Agricultural sciences» the meaning of this value in the last years has a negative development tendency. Thus, the amount of intramural R&D expenditures in 2016 was 6 884,6 mln. tenge (or 10,3 % from total amount) which is 717,8 mln. tenge (or 9,4 %) less than in 2015 and 447,1 mln. tenge (or 6,1 %) less than in 2014.

At the same time the relation of Agricultural intramural R&D expenditures to GDP in 2016 was 0,015 % (or 6 884,6 mln. tenge / 46 971,2 bln. tenge · 100 % / 1000).

Table 2 Amount of intramural R&D expenditures in different sciences

Scientific point	2014		2015		2016	
	in mln. tenge	in % to total	in mln. tenge	in % to total	in mln. tenge	in % to total
Intramural R&D expenditures	66 347,6	100,0	69 302,9	100,0	66 600,1	100,0
Including						
Natural sciences	23 556,8	35,5	25 334,2	36,6	23 496,2	35,3
Engineering research and technologies	26 864,2	40,5	29 618,3	42,7	30 193,4	45,3
Medical sciences	2 795,1	4,2	2 735,4	3,9	2 277,9	3,4
Agricultural sciences	7 331,7	11,1	7 602,4	11,0	6 884,6	10,3
Social sciences	1 486,2	2,2	850,5	1,2	1 072,2	1,6
Humanitarian sciences	4 313,6	6,5	3 162,1	4,6	2 675,8	4,0

Source: [2]. So, the investments in R&D agricultural scientific projects in our country are less than 0,02 %.

In accordance with table 3 the total amount of the researchers in R&D was 17 421 people which is 1 033 people (or 5,6 %) less than in 2015 and 1 509 people (or 8,0 %) less than in 2014.

Table 3 Amount of the researchers with scientific degrees in the scientific branches (in people)

Scientific branch	2014	2015	2016
Totally	18 930	18 454	17 421
Natural sciences	5 729	5 481	5 207
Engineering research and technologies	5 511	5 403	4 661
Medical sciences	1 426	1 316	1 334
Agricultural sciences	1 973	2 259	2 089
Social sciences	1 368	1 279	1 504
Humanitarian sciences	2 923	2 716	2 626

Source: [2]. In the «Agricultural sciences» the meaning of this value in the last years has different – directional development tendency. Thus, the amount of the reseachers in this scientific branch in 2016 was 2 089 people (or 12,0 % from total amount) which is 170 people (or 7,5 %) less than in 2015 and 116 people (or 5,9 %) more than in 2014.

The statistical bodies of Kazakhstan carries out the accounting of intramural R&D expenditures on main three types of works (basic research, applied research and experimental development research).

In accordance with OECD standards «the term R&D covers three types of activity: basic research, applied research and experimental development. Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view. Applied research is original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific, practical aim or objective. Experimental development is systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes» [3].

Due to the statistical data the largest amount of intramural R&D expenditures in 2016 was carried out in «Applied research». Thus, the meaning of this value in 2016 was 35 841,1 mln. tenge (or 53,8 % from total amount). The amount of intramural R&D expenditures in agriculture in applied research was 5 909,9 mln. tenge (or 85,7 % from total amount) [2].

In conformity with OECD methodology the national statistical bodies under carring out the accounting of the intramural R&D expenditures consider four main sectors. They are: «Business enterprise», «Government», «Higher education» and «Private non – profit».

Due to the statistical data the largest amount of intramural R&D expenditures in 2016 was carried out by «Business enterprise» sector. The meaning of this value in 2016 was 28 872,7 mln. tenge (or 43,4 % from total amount). The largest amount of intramural R&D expenditures in agriculture in 2016 was carried out by «Government» sector. The meaning of this value here in 2016 was 3 322,6 mln. tenge (or 48,3 % from total amount) [2].

Conclusions and offerings

All countries of the world (especially among OECD members), which are the world innovative leaders follow OECD standards.

The author pays special attention here to the aspects that determine the result of R&D and distinguish it from other types of scientific research. These important aspects are the elements of originality and novelty.

The following examples, illustrating general differences between basic and applied research and experimental development in agricultural sciences and forestry, are given in the OECD standards [3]:

– for basic research: researchers investigate genome changes and mutagenic factors in plants to understand their effects on the phenome. Researchers investigate the genetics of the species of plants in a forest in an attempt to understand natural controls for disease or pest resistance;

– for applied research: researchers investigate wild potato genomes to locate the genes responsible for resistance to potato blight in an effort to improve the disease resistance in domestic/crop potatoes. Researchers plant experimental forests where they alter the spacing and alignment of the trees to reduce the spread of disease while ensuring the optimum arrangement for maximum yield;

– for experimental development: researchers create a tool for gene editing by using knowledge of how enzymes edit DNA. Researchers use existing research on a specific plant species to create a plan for improving how a company plants its forests to achieve a specific goal.

In conclusion, the author notes that, despite on the several positive aspects of R&D in agriculture in our country, it is necessary to develop the complex plan measures, the implementation of which would allow to provide permanent growth in innovation activity, expressed in the increase of the level of intramural R&D expenditures to GDP.

Thus, summarizing the above, we offer the following:

– develop a comprehensive program that would provide permanent growth of the level of intramural R&D expenditures in agriculture to GDP, containing a plan of measures, the implementation of which would reach at least 1 % by 2050;

– develop the special system of direct and indirect incentives for agriculture that would interest the agricultural businesses in investing the R&D projects;

– develop and implement domestic methodological recommendations for businesses (in accordance with OECD standards) on the basis of the best practices of the countries which are the world innovative and R&D leaders;

– study international legislation on R&D and implement it in Kazakhstan.

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