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TO THE ISSUES OF APPLICATION OF OECD STANDARDS IN TERMS OF SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENT OF AIC IN KAZAKHSTAN

К ВОПРОСУ О ПРИМЕНЕНИИ СТАНДАРТОВ ОЭСР В УСЛОВИЯХ НАУЧНО-ТЕХНОЛОГИЧЕСКОГО РАЗВИТИЯ АПК В КАЗАХСТАНЕ

ҚАЗАҚСТАНДАҒЫ АӨК-ді ҒЫЛЫМИ-ТЕХНОЛОГИЯЛЫҚ ДАМЫТУ ЖАҒДАЙЫНДА ЭЫДҰ СТАНДАРТТАРЫН ҚОЛДАНУ МӘСЕЛЕСІ

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Abstract. Some issues of application of OECD standards (Organization of Economic Cooperation and Development, France, Paris) have been presented in the frame of scientific and technological development of the agro-industrial complex of the Republic of Kazakhstan. Particular emphasis is placed on recommendations of the President of the country N. Nazarbayev on the need to introduce and further application of the OECD standards in Kazakhstan. Particular attention is paid to the important macroeconomic scientific and technological task - the achievement by 2050 of the level of domestic expenditure on R&D in relation to GDP not less than 3%. Different views of modern national researchers regarding the innovative development of AIC in our country have been presented. The statistical information reflecting the current state of scientific and technological sphere has been analyzed, and particular attention is paid to indicators characterizing the innovative development of agricultural sector of the republic, including GDP, internal R&D costs, the ratio of the level of internal costs for their implementation to GDP. The author's recommendations which implementation will increase the innovative potential of AIC of the Republic of Kazakhstan and bring the level of domestic expenditure on R & D in agriculture in relation to GDP to at least 1.0% by 2050.

Аннотация. Представлены некоторые вопросы применения стандартов ОЭСР (Организация экономического сотрудничества и развития, Франция, Париж) в рамках научно-технологического развития агропромышленного комплекса Республики Казахстан. Особый акцент сделан на рекомендациях Президента страны Н. Назарбаева о необходимости внедрения и дальнейшего применения стандартов ОЭСР в Казахстане. Особое внимание уделено важной макроэкономической научно-технологической задаче - достижение к 2050 г. уровня внутренних затрат на НИОКР по отношению к ВВП не ниже 3% Представлены раз-личные точки зрения современных отечественных исследователей в отношении инноваци-онного развития АПК в нашей стране. Проанализирована статистическая информация, от-ражающая текущее состояние научно-технологической сферы, при этом особое внимание уделено индикаторам, характеризующим инновационное развитие сельскохозяйственной отрасли республики, среди них ВВП, внутренние затраты на проведение научно-иссле-довательских и опытно-конструкторских работ, отношение уровня внутренних затрат на их проведение к ВВП. Даны авторские рекомендации, реализация которых позволит повысить инновационный потенциал АПК Республики Казахстан и довести уровень внутренних затрат на НИОКР в сельском хозяйстве по отношению к ВВП к 2050 г., как минимум, до 1,0%.

Аңдатпа. Қазақстан Республикасының агроөнеркәсіптік кешенін ғылыми-технологиялық да-мыту аясында ЭЫДҰ (Экономикалық ынтымақтастық және даму ұйымы, Франция, Париж) стандарттарын қолданудың кейбір мәселелері көрсетілген. Басты акцент еліміздің Прези-денті Н.Ә.Назарбаевтың Қазақстанда ЭЫДҰ стандарттарын енгізу және ары қарай қолдану қажеттігі туралы ұсыныстарына жасалған. Макроэкономикалық ғылыми-технологиялық

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тапсырмаға – 2050 ж. ҒЗТКЖ шығындары деңгейін ЖІӨ-ге шаққанда 3%-ға жеткізуге басты назар аударылған. Еліміздегі АӨК инновациялық дамытуға байланысты қазіргі отандық зерттеушілердің әртүрлі көзқарастары берілген. Ғылыми-технологиялық саланың қазіргі жағдайын көрсететін статистикалық ақпаратқа талдау жасалған. Республиканың ауылшару-ашылық саласының инновациялық дамуын сипаттайтын индикаторға, оның ішінде ІЖӨ, ғы-лыми-зерттеу және тәжірибелік-конструкторлық жұмыстар жүргізуге жұмсалатын ішкі шығындар, оларды жүргізуге ЖІӨ-ге шаққандағы ішкі шығын деңгейі талданған. Авторлар-дың Қазақстан Республикасының АӨК инновациялық әлеуетін көтеруге және ауыл шару-ашылығындағы ҒЗТКЖ жұмсалатын ішкі шығын деңгейін ІЖӨ шаққанда 2050 ж. кем дегенде 1,0%-ға жеткізуге мүмкіндік жасайтын ұсыныстары берілген.

Key words: standards, OECD, costs, agro-industrial complex, gross domestic product, implementation, fundamental and applied research, innovative potential, scientific and technological sphere.

Ключевые слова: стандарты, ОЭСР, затраты, агропромышленный комплекс, валовой внутренний продукт, внедрение, фундаментальные и прикладные исследования, инновационный потенциал, научно-технологическая сфера.

Түйінді сөздер: стандарттар, ЭЫДҰ, шығындар, агроөнеркәсіптік кешен, ішкі жалпы өнім, енгізу, іргелі және қолданбалы зерттеулер, инновациялық әлеует, ғылыми-технологиялық сала.

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].

A. Kozhabayeva, considering the instruments of the state management by innovative development of agriculture, offers the ways of increasing the innovation activity of agricultural entities in the Republic of Kazakhstan. Noting

the fact that one of the directions for innovation process development is the organization and management of introduction of the scientific achievements in production, the researcher believes that the result of introduction of innovations aimed at receiving the profit can be considered as agroinnovations [2].

D. Kaldiyarov, mentioning the issues of low levels of introducing the innovations into kazakhstanian AIC, notes about necessity of the development of strategy aimed at innovative agricultural development based on the use of scientific and technological developments and monetary funds at the global markets [3].

G. Turysbekova and E. Alimkulova consider the innovative processes under development of AIC of Kazakhstan. The authors say that the key role here belongs to the organizational and managerial innovations associated with the development of market infrastructure, transfor-mation of its price stabilization mechanism, in particular grain market infrastructure [4].

E. Ahmediyarov and A. Dzhakupova dis-cuss about problems of innovative development of AIC in the Republic of Kazakhstan based on the consideration of the issues hindering the innovative development of the agricultural sector of our country. The authors present the basic

directions of the reforming the national agricultural science and policy priorities as well as implementing measures which are recommended to the Ministry of Agriculture of the Republic of Kazakhstan [5].

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.

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: [6].			

The amount of intramural R&D expen-ditures 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.

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 30193,4 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 deve-

lopment 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: [see 6].						

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: [see 6].			

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" [7].

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.

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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) [see 6]. 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", "Govern-ment", "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) [see 6].

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 [see 7]:

- 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 of 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 metho-dological recommendations for busi-nesses (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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