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Strategic planning of regional oil-and-fat subcomplex of Russia

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The purpose of the work is to analyze the trends in the development of the oil-and-fat subcomplex as one of the most important components of the agribusiness of the Russian Federation, and state policy in the strategic planning in this sphere. The materials of the United States Department of Agriculture, the State Statistics Service and the Ministry of Agriculture of the Russian Federation served as the information basis for the research. The legislative and regulatory acts of the Russian Federation were used for the analysis of the state policy in the field of strategic planning in the agribusiness. Results of the research showed that the development of the oil-and-fat subcomplex is hampered by a large number of problems, one of which is the absence of the development target program-strategy. The most optimal of the possible options for the development strategy is the formation of a cluster that will allow optimizing the work of all its participants, involved in various spheres of the agribusiness, logistic infrastructure, public authorities, scientific and personnel support, as well as contributes to solving the identified problems. In the study, within the framework of the analysis of the internal and external environment of the oil-and-fat subcomplex, the problems that hamper its development are considered. The advisability of developing a state program for creating a cluster has been revealed and directions for implementing state support for solving technical and technological as well as social and economic problems have been determined.

Key words: Development strategy, agro-food sector, soybean, gross yield, crop yield, sown areas.

INTRODUCTION

The oil-and-fat subcomplex in its present state is a complex multifunctional system that involves a large number of elements, including various markets of the oil primary products-sunflower seed oil, soybean, rape, cotton, palm seeds, etc. The oil-yielding crops are widely used for food production, serve as raw material in the production of industrial products in such sectors as

leather, textile, paint-and-varnish, medical, etc., and in addition to that, the by-products of the oil primary products processing are used in the production of mixed fodder for livestock (Tiwari, 2017; Ramos et al., 2017).

To fully and sustainably meet the needs of the population of individual countries and regions in the products of the oil-and-fat subcomplex, it is

Table 1. Change in the structure and volume of production of the most important types of oil-yielding crops in the world.

Type of oil-yielding crops	2013		2016		2017		Increase in 2017 in relation to in %	
	mln, t	%	mln, t	%	mln, t	%	2013	2016
Arachis Hypogaea	41.9	8.3	42.8	7.5	44.1	7.6	+5.3	+3.0
Copra	5.4	1.1	5.4	0.9	5.5	1.0	+1.8	+1.8
Cotton seeds	45.0	8.9	39.0	6.8	44.6	7.7	-0.9	+14.4
Sunflower seeds	41.5	8.2	47.6	8.3	45.8	7.9	+10.4	-3.8
Rape seeds	71.7	14.2	70.2	12.2	73.1	12.6	+1.9	+4.1
Soya beans	282.7	56.1	351.4	61.2	346.9	60.0	+22.7	-1.3
Palm seeds	15.9	3.2	17.3	3.0	18.6	3.2	+16.9	+7.5
Oil crops, total	504.2	100.0	573.6	100.0	578.6	100.0	+14.8	+1.0

necessary to create for producers, processors and consumers the proper conditions that ensure the production of high-quality products in volumes and in range corresponding to the demand and consumption norms. As the experience of developed countries shows, the solution of these tasks is impossible without the use of strategic planning mechanisms that allow increasing the efficiency of managing elements of the agribusiness. In the conditions of rapidly changing market requirements and growing competition, the main success factor is the ability at the state level to put into practice long-term planning and forecasting, as well as system monitoring and control over the implementation of the strategy in order to identify possible deviations from the adopted line in a timely manner and to correct them (Avadi et al., 2018; Calabro and Vieri, 2015).

The purpose of this study is to analyze current trends in the development of the oil-and-fat subcomplex as one of the most important components of the agribusiness of the Russian Federation, as well as the state policy in the strategic planning in this sphere.

To achieve this goal, the following tasks were set:

(i) To analyze the structure and volumes of production of the main types of oil-yielding crops in the world and in the Russian Federation;
(ii) To identify the main trends and problems for the development of the regional oil-and-fat subcomplex of the Russian Federation;
(iii) To analyze the main documents regulating strategic management in the agribusiness, using the example of the Amur Region as the leading region for soybean production in the Russian Federation.

MATERIALS AND METHODS

The materials presented in this paper are the result of the research conducted on the basis of the All-Russian Scientific Research Institute of Soybean (Russian Federation). As an initial study, a theoretical analysis of the existing methodological approaches to strategic planning in the economic scientific literature (Abigor et al., 2003; Ah Chee et al., 2011; Kozenko et al., 2016; Manzhosova et

al., 2017; Wegren et al., 2015) was carried out. The analytical review made it possible to get an overview of the development of strategic planning in the Russian Federation and foreign countries, to clarify the research issues and to identify key sources of obtaining the information for further work.

Further, an analysis of the structure and volumes of production of the main types of oil-yielding crops in the world and in the Russian Federation was conducted. The analysis was based on the data from the United States Department of Agriculture for the period from 2013 to 2017. As a result of economic and statistical processing of the selected data, the main trends and problems in the development of the regional oil-and-fat subcomplex of the Russian Federation were revealed. In addition to the data of the bodies of the international and internal state statistics of the Russian Federation, we considered the official documents regulating strategic management in the agribusiness, using the example of the Amur Region as the leading region for soybean production in the Russian Federation.

Then, based on the existing experience of strategic planning in the agribusiness studied at the first stage of the research, the optimal variant of the development strategy for regional agro-industrial subcomplexes was chosen and the directions for implementing state support for solving technical and technological as well as social and economic problems were determined.

RESULTS AND DISCUSSION

In the last 5 years, the volume of world production of the most important oil-yielding crops has a stable tendency to growth (Cattelan and Dall'Agnol, 2018; Kuzmenko et al., 2016; Li et al., 2017). At present, soybean occupies a dominant position in the structure of gross yields of agricultural plants of the oilseed group. In 2017, the share of soybean amounted to 60% of the world production (Table 1). The rape and sunflower (12.6 and 7.9%, respectively) take the second and third positions (USDA Foreign Agricultural Service, 2018).

In the period from 2013 to 2017, the production of soya beans demonstrated the highest growth rates, 122.7%; except for cotton, the rest of the crops also showed positive dynamics. The growing interest in soybeans in the world and, as a result, an increase in production volumes, is caused by a wide range of its application. It is associated with a combination of high protein content,

Table 2. Leading oil-yielding crops producing countries as of 2017.

Volume of production, mln t		
Soybeans	**Sunflower seeds**	**Rape seeds**
1. USA - 119.5 (34.3)	1. Ukraine - 13.0 (28.4)	1. EU - 22.1 (30.3)
2. Brazil - 110.0 (31.6)	2. Russia - 10.5 (22.9)	2. Canada - 21.5 (29.5)
3. Argentina - 56.0 (16.0)	3. EU - 9.3 (20.3)	3. China - 13.1 (17.9)
4. China - 14.2 (4.1)	4. Argentina - 3.6 (7.8)	4. India - 6.5 (8.9)
5. India - 10.0 (2.8)	5. China - 2.8 (6.1)	5. Australia - 2.9 (3.9)

All types of oil-yielding crops
1. USA -132.2 (22.8)
2. Brazil - 111.3 (19.2)
3. Argentina - 62.3 (10.1)
4. China - 57.5 (9.9)
5. India – 36.61 (6.3)

*Numerals in brackets are the percentage of total world production.

Table 3. Dynamics of the growth rates of production of the main types of oil-yielding crops of the Russian Federation for 2013-2017.

Type of oil-yielding crops	Rate of Growth (Trn), %				
	2014/2013	2015/2014	2016/2015	2017/2016	Average for 2013-2017
Sunflower	85.6	108.9	119.8	87.2	99.3
Soybean	158.7	111.3	115.7	114.9	123.8
Rape	105.1	76.8	99.5	150.5	104.9
Oil crops, total	97.8	106.8	118.1	95.9	104.3

close in quality to the animal protein, and oil, that is rare for plants. At present, soybean is an indispensable component in fodder production, primary products for the food and chemical industries and for the production of building materials, and in recent years also for biofuel.

According to the Food and Agricultural Organization (FAO) estimates, the Russian Federation took the 8th position in the oil crop production in 2017; and its share in the worldwide production was 2.6% (USDA Foreign Agricultural Service, 2018). The situation is largely determined by the production of sunflower seeds, which is the main oil-yielding crop, cultivated in Russia, and according to the level of which the country takes the second position in the world after Ukraine (Table 2). In 2017, the share of sunflower was 61% in the structure of gross yield of the oil-yielding crops. The soybean takes the second position, both in the structure of sown areas and in gross output (Figure 1).

In recent years, the growth rates of the production of soya beans in Russia significantly exceed the growth rates of production of rapeseeds and sunflower seeds (Chetvertakov, 2015). So, for the period from 2013 to 2017, the production of soybean seeds increased at an average by 24% per year, the similar indicator for rape is 5%, while the sunflower is characterized by a decrease at

an average of 0.7% per year (Table 3).

Historically, the main production of soybean in Russia is concentrated in the Far East. This is due to the proximity to the genetic center of the crop origin and the centuries-old traditions of cultivation (Krivoshlykov et al., 2016). The All-Russian leader in soybean production is the Amur Region. In 2017, a record harvest of soybean was collected in the region. It amounted to 1366.8 thousand tonnes (35.6% in the total amount of yields) (Fedstat.ru). For the year, soybean production increased by 40% or by 389.6 thousand tonnes (Table 4).

Over the past decades, soybean production remains the main direction of agriculture in the Amur Region, the efficiency of which affects the financial and economic situation of the agribusiness of the region. Since only soybean, determining the direction for development of all the spheres of the agribusiness of the region as a whole, is grown from all the crops of the oil-and-fat subcomplex in the Amur Region; in this case, we consider it expedient to use the wording "soy subcomplex" instead of "oil-and-fat subcomplex". The system-forming role of the soy subcomplex for the Amur Region requires the most responsible approach to the elaboration of its development strategy, based on a deep analysis of the situation and the identification of existing development
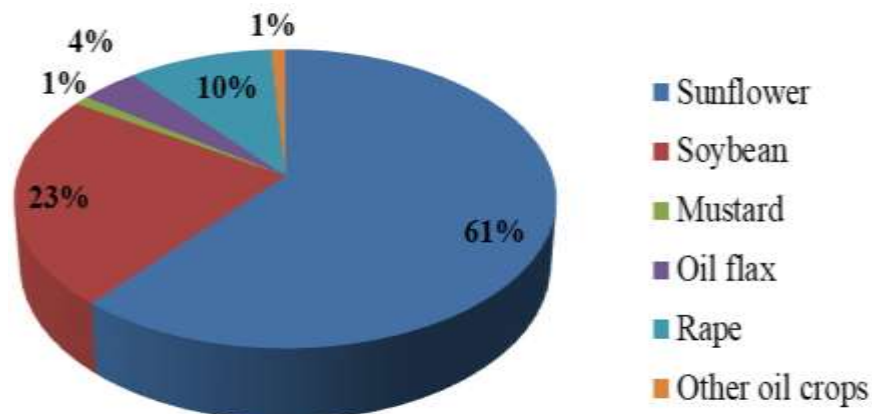
Figure 1. Structure of gross yield of the oil-yielding crops in the Russian Federation in 2017, %.

Table 4. Production of soybean in the main Russian regions engaged in soybean cultivation, thousand tonnes (fedstat.ru).

The Russian federation and its entities	2013	2014	2015	2016	2017
The Russian Federation	1636.3	2596.6	2708.2	3342.4	3842.6
Amur region	398.4	1061	1002	977.2	1366.8
Belgorod region	235.2	241.5	323.9	515.3	347.9
Jewish Autonomous region	60.8	125.7	118.4	99.4	162.1
Krasnodar Krai	313.8	281.3	254.9	330.6	352.2
Kursk region	98.2	151.3	170.2	325.0	311.5
Primorsky Krai	168.5	305.1	262	294.3	379.6
Others	529.9	735.8	838.8	800.6	922.5

trends, barriers and potential opportunities in the conditions of challenges and threats to the external environment.

Trends in the development of the soy subcomplex of the Amur Region

Agriculture in the Amur Region is developing quite dynamically. In 2017, the volume of produced agricultural products amounted to 62225.2 million rubles, 77% of which accounts for the products of plant growing (Table 5). The leading position of the plant-growing sub-sector in the agribusiness of the Amur Region is determined by the production of soybean, as the main crop of the region. So, in 2017, the share of this crop amounted to more than 50% of the value of all the products of the plant-grown and more than 40% of the total agricultural production (Operational Data of the Ministry of Agriculture 2013-2017). According to the estimates of the authors, in 2017, soybeans were produced for a total amount of over 26 billion rubles.

Over the past 5 years, the size of sown areas under soybean in the Amur Region has grown by more than 40%, from 649.7 thousand hectares in 2013 to 964.7 thousand hectares in 2017 (Operational Data of the Ministry of Agriculture, 2013-2017). The growth of sown areas under soybean in the region is not only caused by plowing of fallow land, but also by the reduction in cultivation of other crops that entails a disorder of crop rotations that leads to an increase in weed infestation of crops, diseases damage of soybean, and, as a result, there is a reduction in the crop yield and profitability of its production (Figure 2) (Sinegovskiy, 2015).

Export is one of the main directions of soybean realization in the Amur Region. China is the largest consumer of the Amur soybean. From 2013 to 2017, the export of the Amur soybean grew 6.7 times in physical terms and 9.2 times in value terms (Table 6) (Customs Statistics of Foreign Trade). The share of soybean in the total volume of exports from the Amur Region has also increased, and if in 2013-2014 it did not exceed 5%, then in 2017 it amounted to 24.8%.

The growing interest in the Russian soybean on the part of China is the main reason for the increase in volume of export. This is due to the advantage of the
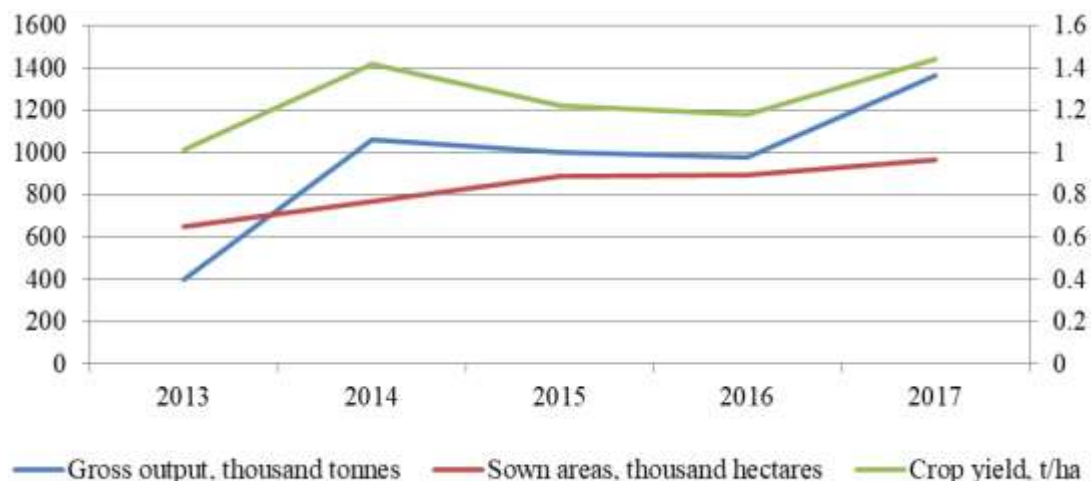
Figure 2. Dynamics of production, sown areas and soybean yield in the Amur Region, 2013-2017.

Table 5. Agricultural production in the Amur region for 2013-2017.

Indicator	2013	2014	2015	2016	2017
Agricultural products, mln rubles	22260.1	39517.7	46712.7	53258.9	62225.2
Plant-growing	10665.8	26960.4	32711.1	38531.7	47753.0
Livestock farming	11594.3	12557.3	14001.6	14727.2	14472.2
Soybean	5899.9	15985.0	21982.4	23511.4	26162.1
Structure of products, %					
Plant-growing	47.9	68.2	70.0	72.3	76.7
Livestock farming	52.1	31.8	30.0	27.7	23.3
Share of soybean in agricultural products, %	26.5	40.5	47.0	44.1	42.0
Share of soybean in plant-growing products, %	55.3	59.3	67.2	61.0	54.8

geographical position of the Amur Region as the main region of the country engaged in soybean cultivation in relation to China with a cheaper ruble, as well as a high gross yield of this crop in the Far East.

The second direction of soybean realization in the region is processing for soy oil, flour, oil-seed meal and other purposes. At present, in the territory of only the Amur Region, there are three oil-extraction plants, which are able to process in total about 500,000 tonnes of soybeans a year, including a plant for deep soybean processing "Amurskiy", which was put into operation in 2017. Totally, the Amur Region is capable of processing 600,000 tonnes of soybean grain.

Main problems of the soy subcomplex of the Amur Region

The functioning of the soy subcomplex is influenced by a range of problems that hampers its development. The main barrier is the absence of the integrated strategic program for the development of soybean cultivation because such program must take into account all the main problems that challenge producers and processers of soybean, and also include a complex of measures aimed at their solution (Malashonok and Pashina, 2016; Manzhosova et al., 2017).

A serious obstacle narrowing down the possibilities of the soy subcomplex organizations is a weak development of the service infrastructure: logistical system for transportation of soybean and soy products; warehouse infrastructure; underdevelopment of the system for providing quality seed material, fertilizers, plant protection products, technical equipment; focus of the market on large producers; difficulty in assessing the farms to credit funds, etc.

High tariffs for rail transportation make it difficult to sell soy primary products produced in the Far East in the amount that exceeds the production capacities of the region. For the processing companies in the western part

Table 6. Dynamics of export of soya grain from the Amur region in 2013-2017 in physical and in value terms.

Indicator	2013	2014	2015	2016	2017
Weight, thousand tonnes	35.2	21.0	206.0	231.4	236.3
Cost, million dollars	8.33	6.5	72.2	76.9	76.6
Export, total, million dollars	446.3	383.3	398.7	340.2	308.6
Share of Soybean in total exports, %	1.9	1.7	18.1	22.6	24.8

of Russia and other consumers of soya beans, it is easier and cheaper to purchase soybean from foreign suppliers (Brazil, Paraguay, Argentina, and Venezuela), which is mostly genetically modified and does not ensure the ecological safety of its processing. The permission for the Russian producers to purchase genetically modified soybean for processing, but under conditions of prohibition of its cultivation in Russia is quite contradictory in this situation.

A competitor for the Western producers is cheap soybean from the North and South American countries. Favorable climatic conditions, developed logistical infrastructure, and also a permission to grow genetically modified soybean allow these countries to obtain high yields at low cost. Even with such a great competitive advantage as the border with China the main importer of soybean grain, the Russian Federation is much inferior in the level of logistics. This is evidenced by the lack of grain terminals in the Far Eastern ports and the discrepancy of the Russian standards of railway gauge to the international level.

The high level of wear and slow rates of renovation of agricultural machines and equipment used in the economy of the region hinder the technical and technological development. The growth of costs for repair and maintenance of the operable condition of out-of-date equipment leads to an increase in the cost-price of the resulting products and, as a consequence, a decrease in incomes of the agricultural producers.

The problem of disorder of crop rotations and the predominance of soybean in crops is also essential. Many agricultural producers cultivate soybean on soybean annually that will certainly have a detrimental effect on the fertility of the soils and the yield of soybean, which lead to an increase in the contamination of the crops and deterioration of the phytosanitary situation in the near future.

In recent years, the number of agricultural specialists has sharply decreased and the professional characteristics of managers and specialists in the level of education, age, and management experience have worsened. One of the main reasons for the shortage of specialists is the lag in the wages of rural workers from the urban ones'. So, in 2017, the average wage of agricultural workers amounted to 28044.7 rubles, which is 23% lower than the average wage of the urban population – 36534.4 rubles. The second reason why the

graduates of agricultural specialties are much more willing to work in other areas is the lack of prestige of working in rural areas. This problem is aggravated by the weak development of the social and household infrastructure of the countryside. The number of institutions rendering services in the healthcare, education, culture decreases annually. The issue of engineering development of rural areas is especially acute.

The development of the soybean industry is also hampered by the unfavorable external environment, in particular, caused by the monopoly of the iII sphere of the agribusiness, which led to an increase in the price disparity for agricultural products, industrial means of production, reinforced by imperfection of price and tax policies, and inaccessibility to concessional lending.

Strategic planning in the agribusiness of the Amur Region

The absence in the majority of regions of the Russian Federation of target-oriented programs for the development of food subcomplexes of the agribusiness, which are currently the main efficiently operating program-target instrument for implementing the priority directions for development, hampers the possibilities to find a comprehensive solution of the existing problems. This takes into consideration the documents, on the basis of which a strategic planning is carried out in the agribusiness of the Amur Region, as a leader of the soybean production in Russia, and the most suitable region for the implementation of the pilot project to create the soy cluster.

The priorities and goals for the development of agriculture, including the soy sub-complex, are laid down in the main document that defines the regional policy of the region in the agribusiness, Strategy of Social and Economic Development of the Amur Region until 2025 (Strategy of Social and Economic Development, 2012). According to the document, one of the main principles of the regional policy of the Amur Region is the formation of the growth points, zones of priority development, clusters and special economic zones (Decree of the Government of the Amur Region, 2012). In the subsection "Prospects for the Application of the Modern Development Mechanisms in the Amur Region" of the Strategy, the soy

cluster is also specified in the list of potential clusters, the formation of which in the case of sufficient investment, will allow the region to create steady competitive advantages. As noted in the document, "The project of creating a soy cluster will allow organizing steady production and technological chains from the cultivation of cereals and oil-yielding crops through their processing to the production of fodders as a basis for the livestock farming development of the meat and dairy directions" (Decree of the Government of the Amur Region, 2012).

The tasks that contribute to the development of the soy subcomplex are also set in the State target-oriented program "Development of the Agriculture and Regulation of the Markets of Agricultural Products, Primary Products and Foodstuffs of the Amur Region in 2014-2020 " and are defined concretely in the subprogram "Development of the Sub-Sector of Plant Production, Processing and Realization of Plant-Growing Products" (Decree of the Government of the Amur Region, 2013).

The two aforementioned documents highlight the following main goals and tasks, which, in the opinion of the developers, should contribute to the development of the soy subcomplex:

i) Expansion of sown areas up to 2 million hectares and bringing the production of soybean and cereals to 2 million tonnes;
ii) Modernization and construction of granaries, elevators, grain processing capacities;
iii) Industrialization of agriculture at the expense of updating the material and technical base with a new high-performance resource-saving equipment;
iv) Increase in the yields and productivity due to new innovative technologies of cultivation, production, application of new highly productive varieties and breeds;
v) Increase in the level of income of the population engaged in agricultural production, quality of life of the rural population, and development of the social infrastructure of the countryside;
vi) Implementation of the target-oriented personnel policy, including training and retraining of personnel, attraction and consolidation of young specialists;
vii) Development of integration connections and formation of food and territorial clusters; development of import-substituting subsectors of agriculture (including soybean production).
viii) Stimulating the development of seed production and yield increase;
ix) Stimulating the development of production and processing of plant-growing products;
x) Development of insurance and credit systems for the sub-sector of plant production;
xi) Reimbursement of partial expenses of agricultural commodity producers for payment of the insurance premium calculated under the contract of agricultural insurance in the field of plant production.

The conducted analysis of the regional policy of regulation of the agribusiness showed that in the agrarian sphere, the policy is distinctly sectoral in nature and the cluster approach is reflected only in the strategy of social and economic development. In fact, the State target-oriented program has not ensured the development of the cluster strategy of the soy subcomplex.

In this context, in our view, the high-priority task of the strategic planning for today is the development of the State-run program "Creation and Development of the Soy Cluster of the Amur Region" aimed at ensuring the integration of enterprises for the production and processing of soybean, serving infrastructure, public authorities, institutes of scientific support, financial and credit support system and other concerned parties within the framework of the united cluster space. The world experience shows that today one of the most effective mechanisms for the solution of the problems existing in agribusiness are cluster structures (Bezrukova et al., 2017; Wardhana et al., 2017; Abrham, 2014).

The considerable financial injections will be required in order to solve the technical and technological, social and economic problems. Because of the low investment attractiveness of the agribusiness, private investors have little interest in investing in its development. Therefore, the role of the organizer and coordinator in technical modernization and solving social problems falls to a greater extent on the state. In particular, financial support should be provided in the following areas:

(i) Subsidizing the purchase of seed material;
(ii) support in obtaining concessional lending for the modernization and construction of granaries, elevators, grain processing capacities and renewal of the machine and tractor fleet;
(iii) Providing state support to agricultural producers in the form of targeted grants and supporting small enterprise;
(iv) Reimbursement of partial expenses for loans;
(v) granting of tax privileges, including the possibility of partial exemption of agricultural producers from taxes;
(vi) Increase in the amount of financial resources aimed at the development of the social and household infrastructure of the rural periphery.

Conclusion

The creation of soy cluster in the region will allow optimizing the work of all its participants involved in various spheres of the agribusiness, logistic infrastructure, public authorities, and scientific and personnel support that will enable achieving the following results:

(1) To increase the efficiency and competitiveness of agricultural enterprises producing soybean.
(2) To increase the soybean production and to expand the number of directions for its processing due to the

scientifically grounded approach (since the cluster provides the grounds for direct interaction between production and science).

(3) To provide the subsector of livestock farming with fodder base, and to provide the population with soybean processing products, which in conditions of low self-sufficiency with meat products, will allow satisfying the need for protein.

(4) To raise the incomes and living standards of the agricultural population.

The success of the strategy for the development of the soy subcomplex depends to a large extent on the financial and organizational support of the Ministry of Agriculture, the Ministry of Economic Development and other departments of the Amur Region in increasing investment and financial transfers to the agricultural sector, solving problems of rural population employment, improving the level and quality of life. The government of the region should form a unified strategy for cluster development of the soy subcomplex of the Amur Region, define a list of targets, and carry out annual monitoring of their achievements with adjustment of the developed measures in order to achieve the intended purposes.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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