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Spatial Development of Rural Territories in Russian Regions: Growth Areas or Desolation Zones?

Anna Alexandrowna Urasova, Dmitry Arkadevich Balandin, Alexander Nikolaevich Pytkin, Elena Borisovna Kovaleva, Igor Yurevich Zagoruiko

Abstract*: Now the Russian economy has an urgent need for the accelerated spatial development of agricultural industries and rural infrastructure. Solving tasks on agricultural management puts forward the problem of determining the reserves of the agricultural production growth in each Russian region as the most urgent one. In this regard, the authors have been aimed at forming a methodology for assessing the development of rural areas and at assessing the modern development of rural areas. The authors have substantiated the selection of the criteria the methodology is based on, and have also argued the results of applying it. The study has been based on the data calculated by using the official statistical information. The study has made it possible to identify growth areas and desolation zones in the development of rural territories in the Perm Territory. Based on this, the authors have offered the targeted approach to the development of these territories. The obtained results are the progressive method for analyzing the development of a rural territory, and can also be used as spatial development management instruments that allow assessing the efficiency of certain activities. The study results are valuable for the science and practice. They can be used when studying and monitoring agricultural industries, sustainable development of rural areas of regions, determining needs in the resources required for the implementation of sectoral and integrated projects and spatial development programs.

***Index Terms*: desolation zone, differentiated approach, growth areas, rural territory, spatial development, sustainable development.**

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***** Correspondence Author
Anna Alexandrowna Urasova*, Perm Branch of the Institute of Economics, UB RAS, Perm, Russian Federation.
Dmitry Arkadevich Balandin, Perm Branch of the Institute of Economics, UB RAS, Perm, Russian Federation.
Alexander Nikolaevich Pytkin, Perm Branch of the Institute of Economics, UB RAS, Perm, Russian Federation.
Elena Borisovna Kovaleva, Perm Branch of the Institute of Economics, UB RAS, Perm, Russian Federation.
Igor Yurevich Zagoruiko, Perm Military Institute of the National Guard Troops of the Russian Federation, Perm, Russian Federation; Perm State University, Perm, Russian Federation.

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I. INTRODUCTION

The Russian rural territories are the most important resource of the country. Their importance in the current conditions has not been fully defined and is associated with the high role of natural and territorial features. In most regions of Russia, rural areas have a huge resource potential and, when more rationally and reasonably used, they can ensure sustainable multisectoral development, employment, high quality and standard of living of the local population, competitiveness, as well as economic independence.

In this article, a rural territory is interpreted as a rural settlement because this term correlates with the Concept of Sustainable Development of Rural Territories of the Russian Federation, as well as with the law on local self-government in the Russian Federation.

In this work, the authors used the differentiated approach that was generally accepted by the state and the most suitable for determining the specifics of the rural settlements' development. Its results will allow developing the necessary measures to overcome the negative effects and accumulate the positive effects of external and internal factors that determine the success of the implemented measures and have impact on the management performance and efficiency of reproduction processes.

The rural territories of the Russian regions are characterized by the agrarian diversity, the availability of other industries: forestry, mining and processing of construction and mineral raw materials, as well as an important recreational value. The rural territories that are economically, politically and ecologically sustainable, as well as socially developed are a guarantee of the Russia's food sovereignty. Therefore, their development vector should become a top priority for the national policy.

Nowadays the policy of sustainable development of rural areas becomes a relevant area for the economic study. The need in the study is determined by focusing the attention of the society on the problems of rural territories. It is impossible to improve the level and quality of life of the rural population without solving them. The transition of the Russian Federation to the sustainable development model involves a balanced solution of socio-economic problems,

the achievement of objectives related to maintaining favorable environment and environmental potential in order to meet the current and future needs of the population.

The need to study the spatial development of rural areas at the regional level is substantiated by the need to immediately improve the life standards of the rural population, as well as the ecological situation.

Various authors considered problems related to the rural development. It is possible to mention works of P.Douglas [1], I.Ushachev [2], J.Kendrick [3], T.Libert [4], and K.Hinrichs [5], who studied the role of agriculture in the world economy, as well as the methods to assess the main trends and factors that had impact on the development of rural areas.

Among the Russian authors, it is also possible to mention I.N. Burobkin, A.L. Pustuev [6], V.Ya. Uzun [7], who studied the issues related to the efficient development of agricultural enterprises in regions. I. Kurtsev [8] systematized the principles of the sustainable development of rural areas. Spatial issues of the rural development are studied in the works of T.M. Eldieva [9], I.V. Kulinin [10], and E.I. Kendyuh [11]. The theoretical aspects of the sectoral development of the agro-industry are systematically described in the work of I.N. Buzdalov [12]. Modeling of individual processes in the development of rural areas and their classification, as well as forecasting can be found in the works of S. Yu. Barsukova [13], V.A. Bessonov, S.V. Tsukhlo [14], G.B. Kleiner [15], and A.V. Plotnikov [16]. In these works, the rural area is interpreted as the original territory that has the conditions for agricultural production to solve the tasks on the spatial development [17].

Certain aspects of the spatial development are studied in the works of L.A. Tretyakova [18], who considers the sustainable development of rural areas as a constantly developing system of the rural community that improves the level and quality of the population's life, constantly increases the agricultural production, and supports the ecological state of life. M.V. Dronova [19] made more detailed definition and interpreted the sustainable rural development as an increase in support for the agricultural production, diversification of the agricultural and non-agricultural sector by types of activity, and included here small business based on the development of agricultural consumer cooperatives in order to improve the level and quality of the population's life.

Thus, the problems of spatial development of rural areas are very widely represented in the modern scientific discourse. However, there are almost no works on the formation of growth areas and desolation zones in certain regions, as well as problems on the diagnostics and assessment, which attracted the attention during this study.

II. METHODS

A. General description

In order to analyze the spatial development of rural areas of the region, it is possible to use various methodologies. Thus, for example, in order to assess the development of rural areas, A.I. Dobrunova [20] used the indicator system based on the concept of coordinated indicators. The offered complex methodology made it possible to use the indicators for differentiating areas of the Belgorod Region, according to the ecological, social and economic state.

In order to monitor the sustainable development of rural areas in the region, E.G., Kovalenko [21] suggests to take a set of relative and absolute indicators substantiating the environmental, economic and social aspects of the village functioning. After that, the development indicators are restructured and ranked on the basis of the indicators score.

When assessing the potential for the sustainable growth of rural areas in the region, A.A. Efimova and E.V. Kamenskaya [22] offer to use the sociological survey method and, using its results, to identify "weaknesses" and opportunities of the spatial development.

At the same time, there are almost no methods to identify and diagnose rural areas as those that activated their development and became growth areas, or vice versa reduced their development rates and turned into potential desolation zones.

B. Algorithm

The authors of this article offer the original method that makes it possible to assess the spatial development of rural areas in the region for the growth areas and desolation zones. At the same time, the growth area is interpreted as a rural territory with a focal nature of the territory's potential growth, a developed infrastructure, an established relationship between local governments and the population, and high rates of agricultural production and positive bioclimatic characteristics.

The desolation zone is a territory where, due to a number of factors, more than 50 % of the agricultural land is not used, which causes an outflow of the population and instability of the rural development, as well as the decrease in the efficiency of agricultural production.

C. Flow Chart

Based on the differentiated approach to the spatial development of a rural territory, as a whole, individual territories, in particular at the regional level, the following methodology is offered in the work (Fig. 1).

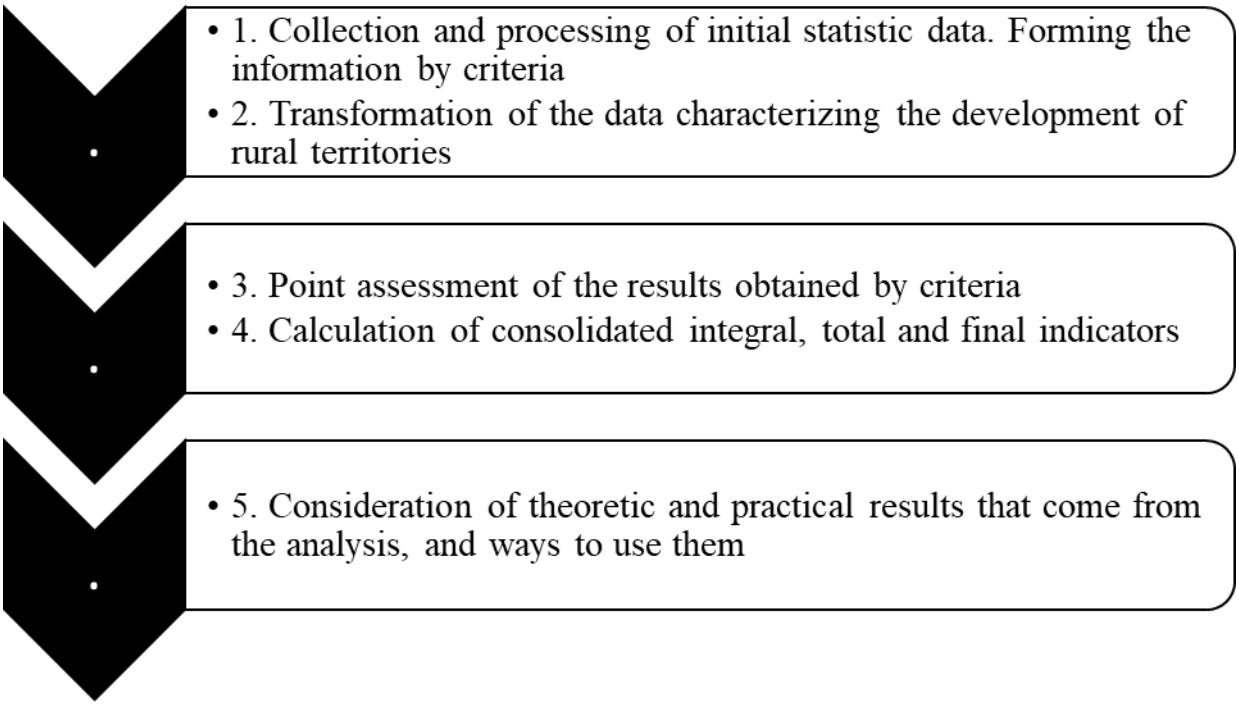

Fig. 1. Method of Identifying Growth Areas and Desolation Zones in Rural Areas of the Region. The calculations were based on the official data of the Federal State Statistics Service of the Russian Federation

III. RESULTS

At the first stage, statistical data for selected rural areas were collected and processed. The rural territories of the Perm Territory of the Russian Federation were used to test the methodology. When determining the general aggregate, all objects under study (rural settlements) were classified into homogeneous typical groups (depending on the municipal area). Afterwards, units from each typical group were individually selected into a sample aggregate by mechanical sampling. It comprised 88 objects.

In addition, the criteria for assessing the spatial development of rural areas, as well as the indicators reflecting these processes over four years, from 2014 to 2017, were identified. Thus, the following criteria were taken for the study:

1. Population dynamics,
2. Transaction costs,
3. Agricultural production,
4. Bioclimatic potential of the territory, and
5. State support.

The criteria were selected specifically for rural areas, taking into account their value for spatial development (Table 1).

Table 1. Criteria for the Spatial Development of Rural Areas of the Region by Indicators

Criterion	Indicators	Unit
1. Dynamics of the population	Size of the population	persons
	Natural growth (-) decrease	persons
	Migration growth (-) decrease	persons
	Birth rate index	permille
	Death rate index	permille
2. Transaction costs	Transaction costs for documenting lands	mln. RUB
	The length of local public roads owned by municipalities	total, kilometers
		hard-surface
3. Agricultural production	Agricultural production	in total bln. RUB
		cattle breeding, bln. RUB
		crop growing, bln. RUB

	Agricultural land used	thous. ha
4. Bio-climatic potential of the territory	Suitability for the population and agricultural production	I- Little comfortable, II- moderately comfortable, III-comfortable.
5. State support	Grants, subsidies, subventions	mln. RUB

At the second stage of the analysis, the authors calculated average indicators over four years.

At the third stage, in accordance with the obtained values, a score was made according to the scale, separately for each rural settlement.

Table 2. Consolidated Figures of Rural Settlements in the Perm Territory by Criteria (in Points)

Rural settlement	Dynamics of the population	Transaction costs	Agricultural production	Bio-climatic potential of the territory	State support
Alnyashinskoe	3.25	3.5	3	2	2
Asovskoe	3	3	3	2	2
Aspinskoe	3.75	2.5	3	2	2
Ashapskoe	2.75	2.5	5	3	2
Bezerovskoe	3.5	2.5	3	2	4
Bicabardinskoe	1.5	2.5	5	3	1
Bolshekukorskoe	3.5	2.5	3	2	2
Bolshegondyrskoe	2.5	2	5	3	3
Bolshekustovskoe	3.25	2.5	5	3	2
Borodulskoe	2.75	3	5	3	2
Vankovskoe	3.5	4.5	3	2	2
Bolsheusinskoe	3	2.5	3	2	2
Verkh-Invenskoe	2.5	3	5	1	5
Verkhnedavydovskoe	2.5	3	1	2	1
Vilvenskoe	3	3	2	2	2
Visimskoe	3	3	2	2	2
Voznesenskoe	1.75	2.5	3	2	3
Gorskoe	2.5	2.5	1	3	1
Gremyachinskoe	3.25	4	1	3	2
Grigorievskoe	2.5	2.5	3	2	3
Diviinskoe	4.25	1.5	2	2	2
Dubovskoe	3	2	3	2	1
Dubrovskoe	2	2.5	1	2	1
Zaborinskoe	2.75	3.5	3	2	1
Zyukaiskoe	2	2.5	3	2	4
Karagaiskoe	3.5	2.5	3	2	5
Karyevskoye	2.75	2	5	3	2
Kozmodemyanskoe	2.5	2.5	3	2	1
Komarovskoe	2.5	2.5	1	2	1
Kondratouvskoe	5	1	4	1	5
Kosinskoe	1.75	2.5	1	1	4
Krasnoberzhkoe	2.5	3	2	2	2
Krasnosludskoe	3.5	3	2	2	2
Krasnoyasylskoe	1.75	2.5	1	3	3
Krylovskoe	3.5	3	1	2	2
Kuedinskoe	2.25	3	5	3	5
Kukushtanskoe	2.75	2.5	4	1	5
Lobanovskoe	4.5	3	4	1	5

Markovskoe	3.5	3	3	2	4
Medyanskoe	1.75	2.5	5	3	4
Mendeleevskoe	3.75	2.5	3	2	3
Mohovskoe	3.5	3	3	2	3
Nevolinskoe	2.75	2.5	3	2	2
Nerdvinskoe	2	3	3	2	2
Nizhnegalinskoe	3.5	3	3	2	1
Nizhnesavinskoe	1.75	2	5	3	2
Nizhnesypovskoe	2.75	2	3	2	2
Nikolskoe	3.5	3	3	2	2
Novozalenovskoe	3	3	1	2	1
Nozhovskoe	4.25	2.5	2	2	3
Obvinskoe	3	4	3	2	4
Olkhovskoe	2.75	3	3	2	4
Ordinskoe	3.25	3.5	5	2	4
Ohiinskoe	2	2.5	5	3	1
Paklinskoe	2	3	1	2	1
Palskoe	3.25	3	1	2	1
Pereborskoe	2.25	3	3	2	2
Platoshinskoe	2.5	2	4	1	2
Pozhvinskoe	1.25	2.5	1	1	5
Polovodovskoe	2.25	2.5	2	2	3
Putinskoe	2.75	3.5	3	2	2
Rodnikovskoe	2.5	2.5	2	2	3
Rozhdestvenskoe	2.25	2.5	3	2	3
Romanovskoe	2.25	4	2	2	2
Ryabininskoe	2.5	3	2	2	3
Savinskoe	3.25	1.5	4	1	5
Senkinskoe	3	3	2	2	2
Sepychevskoe	2.75	3.5	3	2	3
Sosnovskoe	2.5	2	3	2	2
Sylvenskoe	3.25	3	4	1	5
Talmazkoe	3.25	3.5	5	3	1
Tihanovskoe	3.75	2	3	2	1
Troelzhanskoe	3.75	3	3	2	2
Troitskoe	2.25	2.5	2	2	2
Tyulkinskoye	1.75	3	2	2	2
Uinskoe	4	2	3	2	3
Uralskoe	3	2	3	2	1
Ust-Kachkinskoye	2.5	2.5	4	2	5
Fedorovskoe	1.25	3	1	3	2
Fokinskoe	7.75	3	3	2	4
Tchaikovskoe	3.5	3	3	2	3
Chekmenevskoe	3	4	2	2	1
Shagirtskoye	2.5	2.5	5	3	3
Sherinskoe	3	3	3	2	2
Yugo-Kamskoe	3	3	4	2	4
Yugovskoe	2.5	2.5	4	2	2

At the fourth stage, the total score was calculated by all criteria. Based on this, the results were obtained and shown in Table 3. The following scale was used: 1 to 10 points – the rural settlement was located in the desolation zone, above 11 points – the rural settlement was located in the growth area.

Table 3. Consolidated Figures of Growth Points and Desolation Zones of Rural Settlements in the Perm Territory

Municipal Region	Rural settlement	Consolidated figures	●Growth area / ○Desolation zone
Osinskiy	Komarovskoe	9	○
Osinskiy	Verkhnedavydovskoe	9.5	○
Osinskiy	Gorskoe	10	○
Osinskiy	Paklinskoe	9	○
Osinskiy	Novozalesnovskoe	10	○
Kudymkarskiy	Verkh-Invenskoe	16.5	●
Kuedinskiy	Shagirtskoe	16	●
Kuedinskiy	Kuedinskoe	18.25	●
Tchaikovskiy	Fokinskoe	19.75	●
Ordinskiy	Medianskoe	16.25	●
Ordinskiy	Ordinskoe	17.75	●
Karagayskiy	Obvinskoe	16	●
Karagayskiy	Karagayskoe	16	●
Permskiy	Sylvenskoe	16.25	●
Permskiy	Ust-Kachkinskoe	16	●
Permskiy	Lobanovskoe	17.5	●
Permskiy	Yugo-Kamskoe	16	●
Dobrianskiy	Peremskoe	8.75	○
Elovskiy	Dubrovskoe	8.5	○

At the fifth stage of applying the methodology, the following conclusions were made.

The analysis of the spatial development of the rural areas of the Perm Territory has revealed that:

– About 50 % of the rural settlements in the region are in the intermediate area, most of them approaching growth areas,

– 30 % of the rural settlements are in the growth areas, and

– About 20 % are in the desolation zones.

It was revealed that the number of the rural territories of the Perm Territory located in the growth areas exceeded the number of the territories from the desolation zone.

The slowdown of the economic growth in the rural sector, the lack of conditions for the rural employment, the low level of the social and engineering infrastructure development, the destruction of the existing system of population settlement aggravated the number of social problems.

Most rural settlements are often under pressure of such circumstances as the lack of qualified personnel, the lack of jobs, which causes a low standard of living in the countryside, as well as such problems as low birth rates and alcoholism. All this is closely interrelated. The decline in income, negative working and living conditions in rural areas, the narrow scope of forces use, as well as the ongoing policy aimed at destroying “unpromising villages” formed a constantly growing migration of the population to the major industrial centers of the region and Russia.

Hereof it follows about the urgency of the problems related to the spatial development of rural areas in the Perm Territory, which predetermines the further study of the theme on growth areas and desolation zones. The aspects of these territories development will be considered in more details.

In order to clarify the results of the study and deepen the importance of the division of territories, the authors made a statistical analysis to define the relevant criteria (Tables 4 and 5).

Table 4. Correlation matrix for Growth Points Territories

	Dynamics of the population	Transaction costs	Agricultural production	Bio-climatic potential of the territory	State support
Dynamics of the population	1				

Transaction costs	-0.10592	1			
Agricultural production	-0.05083	0.176181	1		
Bio-climatic potential of the territory	-0.06637	0.125772	0.296625	1	
State support	-0.20122	0.208649	0.304498	-0.46937	1

Table 5. Correlation Matrix for Desolation Territories

	Dynamics of the population	Transaction costs	Agricultural production	Bio-climatic potential of the territory	State support
Dynamics of the population	1				
Transaction costs	0.233082	1			
Agricultural production	0.040161	-0.24982	1		
Bio-climatic potential of the territory	-0.2561	-0.06502	0.359530728	1	
State support	-0.05034	0.094646	0.094916827	-0.06367	1

In general, the correlation analysis showed the weakness of the selected criteria, and therefore, it seemed appropriate to assess the homogeneity of the selected objects under study and the tendency to form typical groups within the hierarchical cluster analysis.

The results of the first stage of the cluster analysis, which determines the number of clusters, are shown in Table 6.

Table 6. Formation of Clusters in the Objects under Study

Output for ONE Cluster/Segment					
Mean/Centroid	***Dynamics of the population***	***Transaction costs***	***Agricultural production***	***Bio-climatic potential of the territory***	***State support***
AVERAGE	2.89	2.74	2.97	2.08	2.56
Respondents	**Number**	**%**	**SSE/Segment**		
Segment 1	86	100.0 %	386.7	**SSE Total**	**386.7**
TOTAL	86	100.0 %			
Output for TWO Clusters/Segments					
Mean/Centroid	***Dynamics of the population***	***Transaction costs***	***Agricultural production***	***Bio-climatic potential of the territory***	***State support***
Segment 1	3.28	2.52	3.46	1.79	4.17
Segment 2	2.73	2.83	2.77	2.19	1.94
AVERAGE	2.89	2.74	2.97	2.08	2.56
Respondents	**Number**	**%**	**SSE/Segment**		
Segment 1	24	27.9 %	108.2	**SSE Total**	**282.9**
Segment 2	62	72.1 %	174.7		
TOTAL	86	100.0 %			
Output for THREE Clusters/Segments					

Mean/Centroid	*Dynamics of the population*	*Transaction costs*	*Agricultural production*	*Bio-climatic potential of the territory*	*State support*
Segment 1	2.83	2.70	3.07	1.74	3.96
Segment 2	3.04	2.80	2.37	2.04	1.80
Segment 3	2.42	2.54	5.00	3.00	2.33
AVERAGE	2.89	2.74	2.96	2.08	2.56
Respondents	**Number**	**%**	**SSE/Segment**		
Segment 1	27	31.4 %	82.9		
Segment 2	47	54.7 %	117.2	**SSE Total**	**222.6**
Segment 3	12	14.0 %	22.6		
TOTAL	86	100.0 %			
Output for FOUR Clusters/Segments					
Mean/Centroid	***Dynamics of the population***	***Transaction costs***	***Agricultural production***	***Bio-climatic potential of the territory***	***State support***
Segment 1	2.25	2.83	5.00	3.00	2.33
Segment 2	2.77	3.14	2.25	2.08	1.86
Segment 3	2.58	2.25	5.00	3.00	2.33
Segment 4	3.14	2.43	3.00	1.79	3.29
AVERAGE	2.89	2.74	2.97	2.08	2.56
Respondents	**Number**	**%**	**SSE/Segment**		
Segment 1	6	7.0 %	18.3		
Segment 2	36	41.9 %	77.5	**SSE Total**	**250.0**
Segment 3	6	7.0 %	2.9		
Segment 4	38	44.2 %	151.3		
TOTAL	86	100.0 %			
Output for FIVE Clusters/Segments					
Mean/Centroid	***Dynamics of the population***	***Transaction costs***	***Agricultural production***	***Bio-climatic potential of the territory***	***State support***
Segment 1	2.15	2.90	4.20	3.00	1.40
Segment 2	2.25	2.33	5.00	3.00	3.17
Segment 3	3.00	2.50	5.00	3.00	2.00
Segment 4	2.83	2.70	3.07	1.74	3.96
Segment 5	3.08	2.82	2.41	2.02	1.80
AVERAGE	2.89	2.74	2.97	2.08	2.56
Respondents	**Number**	**%**	**SSE/Segment**		
Segment 1	5	5.8 %	17.5		
Segment 2	6	7.0 %	8.5	**SSE Total**	**220.0**
Segment 3	2	2.3 %	0.1		
Segment 4	27	31.4 %	82.9		

Segment 5	46	53.5 %	110.9		
TOTAL	86	100.0 %			

The allocation of the objects (territories) under study by the selected clusters in each case is presented in Table 7.

Table 7. Allocation of the Objects under Study by the Selected Segments.

Respondent (Case)	Allocated Segment for 1 Cluster	Allocated Segment for 2 Clusters	Allocated Segment for 3 Clusters	Allocated Segment for 4 Clusters	Allocated Segment for 5 Clusters
No. in Segment 1	86	24	27	6	5
No. in Segment 2		62	47	36	6
No. in Segment 3			12	6	2
No. in Segment 4				38	27
No. in Segment 5					46
TOTAL	86	86	86	86	86

Considering that the segment descriptors are variables: the dynamics of the population and transaction costs, the options for cluster formation will be considered graphically (Figs. 1–4).

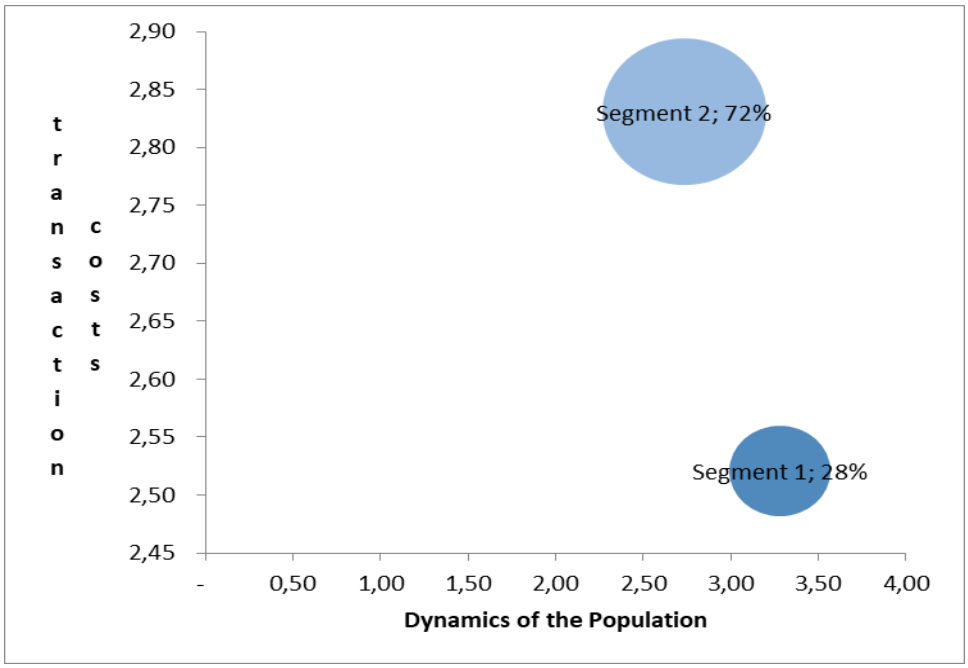

Figure 1. Segmentation for 2 Clusters

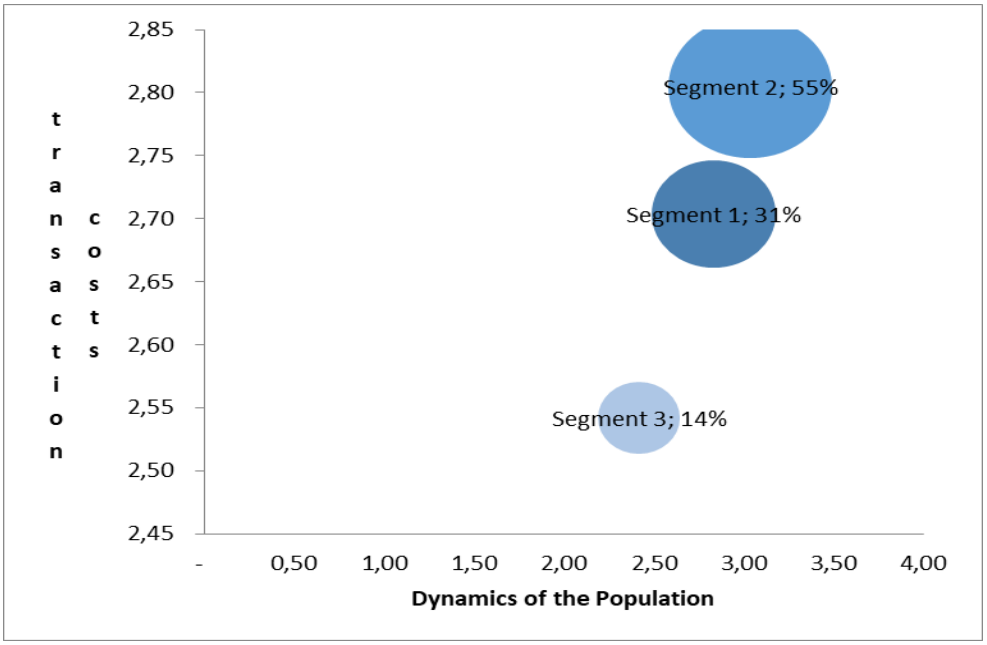

Fig. 2. Segmentation for 3 Clusters

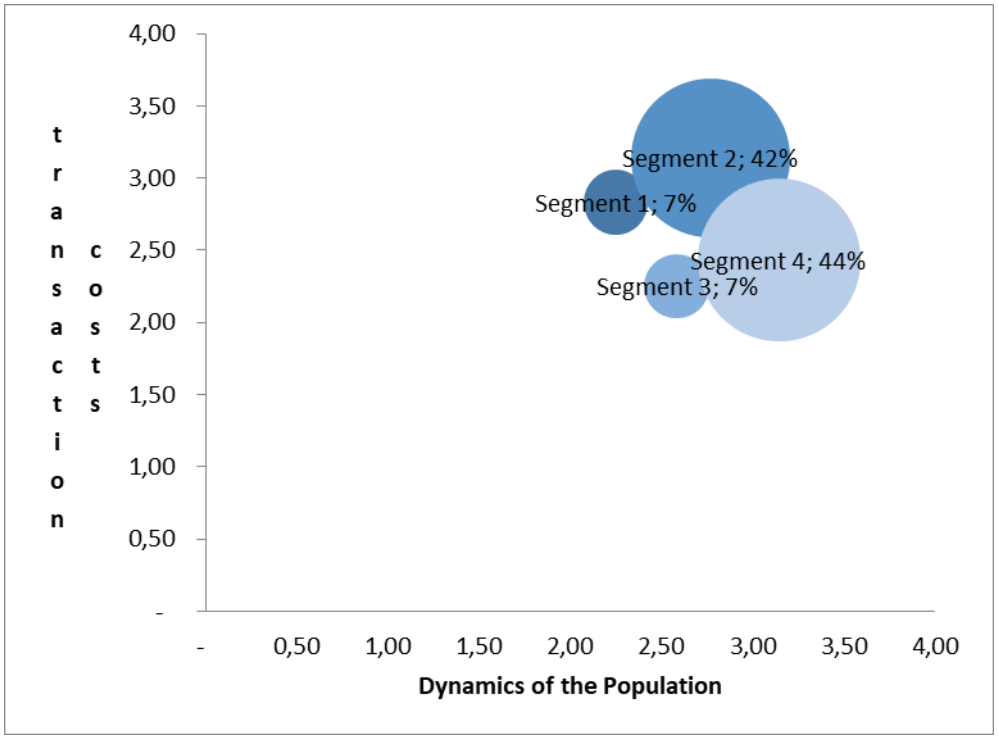

Fig. 3. Segmentation for 4 Clusters

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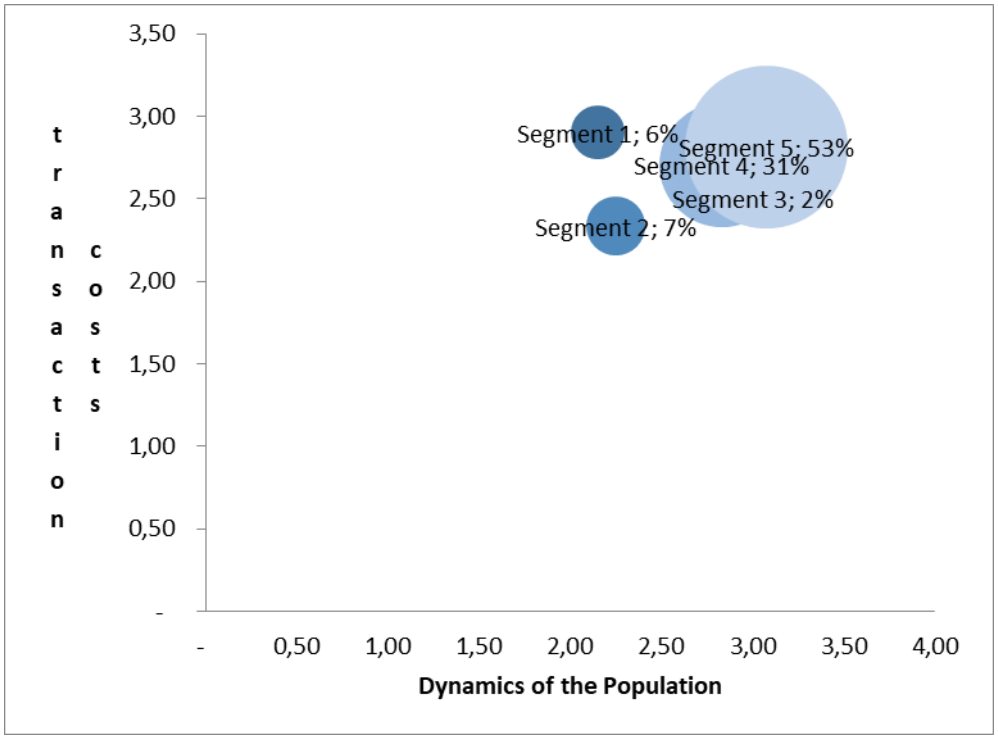

Fig. 4. Segmentation for 5 Clusters

Based on the SSE value for each variant of segmentation, it is possible to make the conclusion that it is most appropriate to select about 3 – 4 clusters among the objects under study.

IV. DISCUSSION

In order to achieve the goals of the spatial development, it is necessary to timely identify and eliminate the problems of rural areas, as well as to balance the potentials and capabilities.

The Perm Territory carries out a general program of the spatial development, and together with municipal districts, it implements programs for the development of certain rural territories.

According to the above methodology, the territory with many benefits is defined as a growth area. The rural areas of the Perm Territory that belong to this category will be considered.

The Perm municipal district and its rural settlements: Kondratovskoe, Lobanovskoe, Sylvenskoe, Ust-Kachkinskoe and Yugo-Kamskoe make up the area where most of the rural settlements out of the rural areas under study are growth areas. The agro-industrial complex of the Perm municipal district has a huge agrarian potential. Agricultural production of the region is represented by 16 agricultural enterprises of various forms of ownership. The profit earned by the industry is formed mainly due to government subsidies. Currently, the Perm municipal district is implementing a targeted program "Agriculture and Sustainable Development of Rural Territories of the Perm Municipal District for the Medium Term of 2016 – 2020 [23]". On the territory of rural settlements, there are such municipal programs as "Improving Municipal Management", "Providing Quality Housing and Public Utilities Services", "Development of the Transport Complex", "Resource Management", "Providing Security", "Social Support", etc.

The Karagaysky municipal district, the rural settlements of Karagayskoe and Obvinskoe are also in the zone of economic growth. The territory has the target program "Development of Agriculture in the Karagaysky municipal district for 2014 – 2020" [24] approved by the Decree of the Administration of the Karagaisky municipal district and such subprograms as "Development of Agricultural Enterprises", "Support for Small Business Forms", "Sustainable Development of Rural Territories of Karagaysky Municipal District ". The Karagaysky district is the leader among the districts of the Perm Territory for a number of indicators of agricultural production. A considerable contribution to the production and sale of agricultural products was made by such groups as: JSC *PTF Mendeleevskaya*, LLC *Pobeda Agrofirm*, LLC *Agrorus*, the *Kalinin* collective farm, *Michurin* APC, *Niva* APC, etc. The financial and economic indicators of the agricultural enterprises of the region could have been much better if not the continuing disparity of prices, the increase in prices and tariffs for the consumed resources.

The Kuedinsky municipal district, the rural settlements of Kuedinskoe, Shagirtskoe are in the zone of economic growth. The territory is implementing the target program "Development of Agriculture in the Kuedinsky Municipal District" [25] and others. The Kuedinstky municipal district competitively provides farmers with subsidies to reimburse half of their costs.

The Tchaikovsky municipal district and the rural settlement of Fokinskoye are the growth area. The agricultural production is significant in the district, and has a considerable potential for the development. On the territory of the district there are two enterprises processing agricultural products – CJSC *Moloko* and CJSC *Meat Agrofirm*. CJSC *Tchaykovskaya Poultry Farm* processes poultry products.

In terms of gross agricultural output, the Tchaikovsky District ranks fifth in the Perm Territory. The territory is implementing the program "Development of Agriculture in the Tchaikovsky Municipal District for 2014 – 2020" [26].

The Ordinsky municipal district and the rural settlements of Ordinskoye and Medyanskoe are the growth areas. The territory is implementing such programs as "Development of Agriculture in the Ordinsky Municipal District for 2014 – 2017 and for the Period up to 2020" [27] and "Development of Agriculture" [28]. The industry of the region is represented by *Uralsky Kamnerez* OJSC, *Uralskiy Kamnerez – National Crafts*, LLC, the enterprise of the Ordinsky district organization of All-Russian Society of the Disabled – printing house, *Syrodel* LLC, *Soyuzlesprom* LLC, and *OrdALESPROM* LLC.

In separate municipal districts of the region, there are counter-trends in the spatial development of rural areas. For example, in the Verkh-Invensky rural settlement of the Kudymkarsky municipal district the state support is higher than that in other rural settlements. The rural settlement is implementing the following programs: "Optimization of Expenses and Action Plan to Increase Tax and Nontax Budget Revenues" [29] and "Providing Subsidies from the Local Budget to Nonprofit Organizations that are Not State (Municipal) Institutions" [30]. The policy of the rural settlement is focused on local entrepreneurs who provide most of the budget revenues. A considerable contribution to the spatial development of the rural territory is made by the local meat processing plant. Therefore, the Verkh-Invensky rural settlement is the growth area in the Kudymkarsky municipal district.

As mentioned above, according to the authors' methodology, some rural areas belong to the desolation zone.

In the Osinsky municipal district, five rural settlements are located in the desolation zone: Komarovskoe, Verkhnedavydovskoe, Gorskoe, Paklinskoe, and Novozalesnovskoe. Currently, the Osinsky municipal district is implementing the municipal program "Development of Agriculture of the Osinsky Municipal District" [31]. Here rural settlements are co-executors and implementing subprograms for the development of the territory, e.g., "Development of Top Priority Agricultural Sectors and Efficient Use of the Resource Potential" and "Support for Small Businesses". The program is not designed for a specific period, and is always valid in the area. Since industry is the main branch of the economy, the agricultural activity loses its attractiveness, and a lot of rural areas of the region are in the desolation zone.

As for the Yelovsky municipal district and its Dubrovskoye rural settlement, on the territory of the municipal district, there are four agricultural producers: *Leader* LLC, *Polyudovo* AE, *Furmanova* APC, and *Kirov* APC. There are no profitable agricultural organizations. Agricultural enterprises employ less than 90 people.

Speaking about the Dobryansky municipal district and its Peremskoye rural settlement, the agriculture of the Dobriansky municipal district is represented by *Prikamie Agrofirm* LLC in the village of Senkino, LLC *Zolotoe Runo* in the village of D. Lunezhki, LLC *Teplichnoe Hoziaystvoo* in the village of Dobryanka, and *Dobriansky Fish Center* LLC. The district provides subsidies to help achieving the target indicators of regional programs for the development of the agro-industrial complex [32]-[34], as well as grants for the development of the material and technical base of the agrarian sector. On the territory of the district, the leading role in the structure of the economy belongs to the fuel and energy complex. Therefore, rural areas are in the desolation zone.

Following the authors' methodology, the authors consider each rural settlement separately in order to see the peculiarity of each rural territory and develop the sector of the economy this territory is most adapted to. The differentiated approach and the method of identifying growth areas and desolation zones in the rural territories of the region show their importance for ensuring the competitiveness of the development of each territory, depending on the potential and local specific features.

V. SUGGESTIONS

Based on the results of the analysis, it is possible to make a number of practical suggestions.

In order to comprehensively solve the problems related to the spatial development of rural areas, the authors suggest organizing Agrarian Coordination Centers affiliated to the Governments (Administrations) of the constituent entities of the Russian Federation and involving participants of the financial market – banks and insurance agencies. There are many benefits of insurance, including the reduction of risk and uncertainty, covering the damage at the expense of insurance payments, tax benefits for insurance operations, as well as a relatively low cost as compared to other methods of risk management.

The most important savings of the rural economy in the modern conditions are not only the resources of agriculture and forestry, sufficiently qualified and cheap labor resources, but also rather cheap land as the basis for the manufacturing industry. In the modern conditions, such asset as natural attractions for the development of tourism, recreation, etc. is getting more and more valuable.

The rural areas which create comfortable conditions for residents and workers by developing the infrastructure and forming the attractiveness for investors become areas of the economic growth.

VI. CONCLUSION

The study is of a certain scientific and practical importance.

The obtained results can be used in scientific studies, in the educational process when training bachelors and masters, as well as when training specialists on the problems related to the agricultural development in regions.

The developed method is an efficient instrument that allows assessing the efficiency of the spatial development management in the regions. The results of the work can be used in the current activities of state, municipal and public organizations related to the regulation and support for agriculture, and the development of rural infrastructure, including for adjusting the management based on scientific data.

REFERENCES

1. P. Douglas, "*Comments on the Cobb-Douglas Production Function. The Theory and Empirical Analysis of Production*". Columbia University Press, National Bureau of Economic Research, 1967, pp. 15–22. Available: http://www.nber.org/chapters/c1474.
2. I.G. Ushachev, "Social and Economic Development of Agro Industrial Complex in Conditions of Russia Membership in the World Trade Organization and the Eurasian Economic Union". *Bulletin of the Oryol State Agrarian University*, vol. 50(5), 2014, pp. 3-11.
3. J.W. Kendrick, "*Productivity Trends in the United States*". Princeton, 1961.
4. T.D. Lybbert, "Summer Agricultural Technology for Climate Change Mitigation and Adaptation in Developing Countries". *Policy Options for Innovation and Technology Diffusion Issue Brief, vol. 6*, 2010.
5. C. Hinrichs, "Regionalizing Foodsecurity? Imperatives, Intersection Sand Contestationsin a post-9/11 world". *Journal of Rural Studies, vol. 29*, 2013, pp. 7-18.
6. I.N. Burobkin, A.L. Pustuev, K.Zh. Zhaparov, "*Povysheniye ustoychivosti funktsionirovaniya agropredpriyatiy*" ["Improving the Sustainability of Agricultural Enterprises"]. Moscow. 2003.
7. V.Ya. Uzun, "*Krupnyy i malyy biznes v selskom khozyaystve Rossii: adaptatsiya k rynku i effektivnost*" ["Large and Small Agricultural Business in Russia: Adaptation to the Market and Efficiency"]. Moscow: FSNU "Rosinformagrotekh", 2005.
8. I. Kurtsev, "Sistemnye printsipy ustoychivogo razvitiya selskogo khozyaystva" ["System Principles of Sustainable Development of Agriculture"]. *AIC: Economics and Management*, *vol. 6*, 2008, pp. 8-10.
9. T.M. Eldieva, "*Formirovanie mnogoukladnogo selskogo khozyaystva*" ["Formation of Mixed Agriculture"]. V. Novgorod. 2011.
10. I.V. Kulinin, "Formirovaniye konkurentnoy sredy v agrarnoy sfere ekonomiki" ["Formation of the Competitive Environment in the Agricultural Sector of the Economy"]. *Bulletin of the Krasnoyarsk State Agrarian University*, *vol. 6*, 2007, pp. 16 – 20.
11. E.I. Kendyukh, "Formy konkurentsii v agrarnom sektore ekonomiki" ["Forms of Competition in the Agrarian Sector of the Economy"]. *Economics and Management*, *vol. 4*, 2007, pp. 70-79.
12. I.N. Buzdalov, "*Agrarnaya teoriya: kontseptualnye osnovy, tendentsii razvitiya, sovremennye predstavleniya*" ["Agrarian Theory: Conceptual Framework, Development Trends, and Modern Ideas"]. Moscow: Academia, 2005.
13. S. Yu. Barsukova, "*Vydeleniye regionov, neblagopriyatnykh dlya vedeniya selskogo khozyaystva, ili kak v Rossii sobirayutsya pomogat selskomu khozyaystvu v usloviyakh chlenstva v VTO*" ["Defining Regions that are Unfavorable for Farming, or How Russia is Going to Help Agriculture in Terms of Membership in the WTO"]. Available: http://institutiones.com/agroindustrial/2402-vydelenie-regionov-neblagopriyatnyx-dlya-vedeniya-selskogo-xozyajstva.html
14. V.A. Bessonov, and S.V. Tsukhlo, "*Problemy postroyeniya proizvodstvennykh funktsiy v rossiyskoy perekhodnoy ekonomike*" ["Problems of Forming Production Functions in the Russian Transition Economy"]. Analysis of the Dynamics of the Russian Transition Economy. Moscow: Institute for the Economy in Transition, 2002, p. 5-89.
15. G. Kleiner, "*Proizvodstvennyye funktsii: teoriya, metody, primeneniye*" ["Production Functions: Theory, Methods, Application"]. Moscow: Finance and Statistics, 1986.
16. A.A. Urasova, A.N. Pytkin, I.Y. Zagoruyko, A.V. Plotnikov, and V.P. Cherdantsev, "Prospects of Development of Agricultural Branches of the Regions of the Russian Federation: Correlation Models and Effectiveness of Management". *International Journal of Engineering and Technology(UAE), vol. 7*, 2018, pp. 591 – 596.
17. D.A. Balandin, "*Sovershenstvovaniye upravleniya ustoychivym razvitiyem selskikh territoriy*" ["Improving the Management of Sustainable Rural Development"]. Ekaterinburg: Ural Branch of the Russian Academy of Sciences, 2014.
18. L.A. Tretyakova, "*Mestnoye samoupravleniye kak osnovopolagayushchiy faktor ustoychivogo razvitiya selskikh territoriy*" ["Local Government as a Fundamental Factor in the Sustainable Development of Rural Areas"]. Available: https://cyberleninka.ru/article/n/mestnoe-samoupravlenie-kak-osnovopolagayuschiy-faktor-ustoychivogo-razvitiya-selskih-territoriy
19. M.V. Dronova, "*Teoreticheskiye podkhody k ustoychivomu razvitiyu selskikh territoriy*" ["Theoretical Approaches to the Sustainable Development of Rural Areas"]. Available: http://izron.ru/articles/voprosy-i-problemy-ekonomiki-i-menedzhmenta-v-sovremennom-mire-sbornik-nauchnykh-trudov-po-itogam-me/sektsiya-2-ekonomika-i-upravlenie-narodnym-khozyaystvom
20. A.I. Dobrunova, "*Metodika otsenki urovnya razvitiya selskikh territoriy Belgorodskoy oblasti*" ["Methods of Assessing the Level of Development of Rural Areas in the Belgorod Region"] Available: https://docviewer.yandex.ru/view/0/?*=Y7%2FXj4JqDDrO1iVjNcZmhOcAkdh7
21. E.G. Kovalenko, "*Modernizatsiya mekhanizma ustoychivogo razvitiya selskikh territoriy*" ["Modernization of the Mechanism of Sustainable Development of Rural Areas"]. Available: https://monographies.ru/en/book/section?id=7382
22. A.A. Efimova, and E.V. Kamenskaya, "*Predposylki preodoleniya depressivnosti selskikh territoriy*" ["Prerequisites to Overcome the Depression of Rural Areas"]. Available: http://mich-agrovestnik.ru
23. Postanovleniye administratsii Permskogo munitsipalnogo rayona ot 29.09.2015 No. 1317 "*Ob utverzhdenii munitsipalnoy programmy. Selskoye khozyaystvo i ustoychivoye razvitiye selskikh territoriy Permskogo munitsipalnogo rayona na srednesrochnyy period 2016 – 2020 gody*" ["Decree of the Administration of the Perm Municipal District dated 29.09.2015 No. 1317 "On Approval of the Municipal Program "Agriculture and Sustainable Development of Rural Territories of the Perm Municipal District for the Medium Term 2016 – 2020" "]. Available: http://ush.permraion.ru/files/2016/page/28.10.2015_no_1372_ob_utverzhdenii_municipalnoy_programmy_selskoe_hozyaystvo_i_ustoychivoe_razvitie_selskih_territoriy_pmr_na_2016-2020gg.pdf
24. Postanovleniye administratsii Karagayskogo munitsipalnogo rayona ot 31.10.2013 No. 423 "*Ob utverzhdenii munitsipalnoy programmy "Razvitiye selskogo khozyaystva v Karagayskom munitsipalnom rayone na 2014 – 2020 gody*" " ["Decree of the Administration of the Karagayskyi Municipal District dated 31.10.2013 No. 423 "On Approval of the Municipal Program "Development of Agriculture in the Karagayskyi Municipal District for 2014 – 2020" "]. Available: http://minter.permkrai.ru/upload/iblock/f20
25. Postanovleniye administratsii Kuyedinskogo munitsipalnogo rayona ot 19.11.2014 No. 676-pa "*Ob utverzhdenii munitsipalnoy programmy Razvitiye selskogo khozyaystva v Kuyedinskom munitsipalnom rayone*" [Decree of the Administration of the Kuedinsky Municipal District dated 19.11.2014 No. 676-pa "On Approval of the Municipal Program "Development of Agriculture in the Kuedinsky Municipal District" "]. Available: https://docviewer.yandex.ru/view/0/?*=JPsGbmiNO0DqI2eG33JlbN3hp1F7InVybCI6Imh0dHA6Ly93d3cuYWRta3VlZGE
26. Postanovleniye administratsii Chaykovskogo munitsipalnogo rayona ot 01.11.2013 No. 2923 "*Ob utverzhdenii munitsipalnoy programmy Razvitiye selskogo khozyaystva v Chaykovskom munitsipalnom rayone na 2014 – 2020 gody*" ["Decree of the Administration of the Tchaikovsky Municipal District dated 01.11.2013 No. 2923 "On Approval of the Municipal Program "Agricultural Development in the Tchaikovsky Municipal District for 2014 – 2020" "]. Available: http://permkrai.info/2013/11/01/p66616.htm
27. Postanovleniye administratsii Ordinskogo munitsipalnogo rayona ot 17.10.2013 No. 726 "*Ob utverzhdenii programmy Razvitiye selskogo khozyaystva v Ordinskom munitsipalnom rayone na 2014 – 2017 gody i na period do 2020 goda*" ["Decree of the Administration of the Ordinsky Municipal District dated 17.10.2013 No. 726 "On Approval of the Program "Development of Agriculture in the Ordinsky Municipal District for 2014 – 2017 and for the Period up to 2020" "]. Available: http://orda.permarea.ru/organy_vlasti/administracija/programmy_i_projek/
28. Postanovleniye administratsii Ordinskogo munitsipalnogo rayona ot 08.10.2013 No. 709 "*Ob utverzhdenii programmy Razvitiye selskogo khozyaystva v Ordinskom munitsipalnom rayone*" ["Decree of the Administration of the Ordinsky Municipal District dated 08.10.2013 No. 709 "On Approval of the Program "Development of Agriculture in the Ordinsky Municipal District" "]. Available: https://docs.google.com/viewer?url=http://orda.permarea.ru/upload/pages/22430/dat_143771815148.doc

29. Postanovleniye No. 47 ot 26.03.2018 "*Ob utverzhdenii programmy optimizatsii raskhodov i plana meropriyatiy po uvelicheniyu nalogovykh i nenalogovykh dokhodov byudzheta Verkh-Invenskogo selskogo poseleniya na 2018-202*" ["Decree No. 47 dated 26.03.2018 "On Approval the Program on Optimizing Expenditures and Plan of Measures to Increase Tax and Non-Tax Revenues of the Verkh-Invenskiy Rural Settlement Budget for 2018-202"]. Available: http://verhinva.ru/documents/acts/detail.php?id=768820
30. "*Ob utverzhdenii munitsipalnoy programmy Blagoustroystvo na territorii Verkh-Invenskogo selskogo poseleniya Kudymkarskogo munitsipalnogo rayona na 2018 – 2020 gody*" ["On Approval of the Municipal Program "Improvement in the Territory of the Verkh-Invenskiy Rural Settlement of the Kudymkarsky Municipal District for 2018 – 2020" "]. Available: http://verhinva.ru/documents/acts/detail.php?id=733931
31. Postanovleniye administratsii Osinskogo munitsipalnogo rayona ot 17.04.2014 No. 961 "*Ob utverzhdenii munitsipalnoy programmy Razvitiye selskogo khozyaystva Osinskogo munitsipalnogo rayona*" ["Decree of the Administration of the Osinkiy Municipal District dated 17.04.2014 No. 961 "On Approval of the Municipal Program "Development of Agriculture in the Osinskiy Municipal District" "]. Available: http://osa-perm.ru/agropromyshlennyj-kompleks/normativnye-dokumenty/5542-postanovlenie-961-09022017.html
32. Postanovleniye Pravitelstva Permskogo kraya ot 31 yanvarya 2018 goda No. 48-p "*Ob utverzhdenii poryadka predostavleniya subsidiy na sodeystviye dostizheniyu tselevykh pokazateley regionalnyh programm razvitiya agropromyshlennogo kompleksa*" ["Decree of the Government of the Perm Territory dated January 31, 2018 No. 48-p "On Approval of the Procedure for Granting Subsidies to Help Achieve the Targets of Regional Programs for the Development of the Agro-Industrial Complex"]. Available: http://dobrraion.ru/ekonomika_i_biznes/selskoe_hozyaystvo
33. Y. Moldakenova, A. Bakirbekova, L. Moldashbayeva, V. Biyev, and N. Yskak, "Kazakhstan and the European Union: Prospects of Cooperation in Developing the Agro-industrial Sector of Economy", *Journal of Advanced Research in Law and Economics, vol. 8*(6), 2017, pp. 1861-1874.
34. A.N. Zhildikbaeva, A.I. Sabirova, T. Pentaev, and A.D. Omarbekova, "Improving the Agricultural Land Use System in the Republic of Kazakhstan", *Journal of Environmental Management and Tourism, vol. 9*(7), 2019, pp. 1585-1592.