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Innovative development of agrifood system in Sverdlovskaya oblast of Russia

Sergey N. Polbitsyn*, Veniamin V. Drokin and Alexei S. Zhuravlev

Institute of Economy, Ural Branch of Russian Academy of Sciences Russia.

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The study examines whether the goal of food security for the population of Sverdlovskaya oblast, one of the mostly industrial northern region in Russia, aiming agricultural productivity improvement and rural poverty reduction, could be achieved by the regional authorities within post-soviet type of agricultural policy. Results show that, the current trends of agricultural production and rural social development in Sverdlovskaya oblast are degrading. To reach the goal of regional food security and to change declining trends in production it is necessary to ensure the priority of social goals over economic development, because providing higher standards of rural livelihoods will inevitably lead to the sustainable development of agricultural production. The study aims to determine the conceptual foundations of the transition of rural localities of industrial region of Russia towards sustainable development through the creation of decent living conditions and activities of the rural population in quality food production. Particular attention is focused on the mechanism of interaction and coordination among federal and regional governments, local governments and commercial organizations engaged in its food production activities in the rural areas. On the basis of theoretical propositions is the conceptual model of innovative development of rural areas in an industrial region, namely Sverdlovskaya oblast of Russia, aiming quality food production for the population of region is presented.

Key words: Agrifood system, innovation, rural development, Russia.

INTRODUCTION

Sverdlovskaya oblast is located between 56° and 60° North in Siberian part of the Urals Mountains. The climate is continental with average annual temperature 0°C and frost-free period of 100 days. The soil is mostly infertile loam, and the territorial agricultural output is quite low. The average wheat yield per acre is about 20 bu. Suitable for agriculture lands amount 13.34% of total territory. The local agricultural produce covers only 15% of local population needs in food (Sverdlovskaya oblast in 2007 to 2011).

The total population of Sverdlovsk oblast is 4307 thousand people in 2011. The share of rural population is

16%. The major native ethnic groups are Russians (90.6%), Tatars (3.5%), Ukrainians (0.9%), Bashkirs (0.8%), and Mari (0.6%). The unemployment level in the rural localities consists of 3.5%. Due to peculiarity of the Russian system of welfare most of unemployed rural people do not have any income. Regional per capita income was 24879.3 rub (approximately US\$830) per month (Sverdlovskaya oblast in 2007 to 2011).

Despite the different ethnicities, most of population follow the same highly nourishing diet of northern type (Hasnulin et al., 2006), consisting mainly of proteins of animal and plant origin (approximately 80 g of animal fat

*Corresponding author: E-mail: sergey.polbitsyn@icloud.com. Tel: +7(912) 261-0053.

and 50 g of vegetable fat daily).

The political system of Russian federation inherited from Soviet time's tendency to give more power and resources to the federal government, rather than to municipal authorities, causing greater involvement of federal and regional administration into local agrifood systems. The Soviet originated regional food system aimed the only goal to provide sufficient amount of basic food for the population. Still now after the collapse of the Soviet Union, the major food security principles of Russia target the availability of basic food (Boycko et al., 1995).

However, stated principles of food availability do nothing with food quality that is, required by the population, and today more and more researchers and practitioners raise the question of food quality (Gregory, 1990). Investigating an agrifood system of industrial northern regions, it is necessary to emphasize the mandatory requirement that food must meet the wide range of needs of people living in extreme climatic conditions not only basic needs (Hasnulin, 2009).

Nowadays the existing system of food production and distribution in Russia cannot be named sufficient and prospective (Goldman, 1992). The innovative agrifood system must provide the population not only with necessary basic food but also with the whole range of variety of special types of food required by population in northern regions (Aleksandrova and Kireyeva, 2012). However, the practice of agricultural production in Russia is based on a soviet model that is, mostly suitable for southern and central regions of Russia (Anfinogentova, 2013).

Innovative model of a regional agrifood system have to be closely related to the climatic conditions of the territory and the historically developed way of life and human activity, therefore it should be built on traditions of not only of agriculture but also of food consumption (Zalivcheva, 2013).

Theoretical foundations and hypothesis

Theoretical model of regional agrifood systems, which allows the determination of the perspectives for innovative development, cannot be formed without a systematic analysis of the development of agriculture and food distribution system in the region, especially when it comes to predominantly industrial region.

The identification and implementation of economic capacity of the northern regions of the Russian federation must be based on the analysis of both prospective and historical development of the region, therefore, historical knowledge is not only a basis for understanding the territorial model of agriculture and the prediction of its development, but also an important component in the management of territorial development, particularly in the context of food security in the region. To determine the prospective agrifood system model, we need to

consider not only the economic capacity of the region but also a demographic factor, which is characterized by two trends: the declining share of rural population and a sharp increase in urban or industrial population caused by migration from other regions.

Thus, we should point out three specific underlying factors that influence the formation of the agrifood system model in the northern region:

- (a) Climatic characteristics of the region
- (b) Forecast for the growth of local (regional) food markets
- (c) Local specific features of agriculture

It may be noted that, differences in northern regions are defined by the differences in the potency of these specific factors, and, assuming that, the regional industrial development leads to creation of new local food markets and growth of existing local markets, we should recognize that, the difference in industrial development should result in a fluctuation change of agrifood system model in the region.

Key provisions of the agro-innovation system model for the northern industrial region, to our opinion, may be formulated as follows:

- (i) Nutritional needs of the population of the northern regions differ from the needs of the population of the southern regions. These needs are determined by harsh climatic conditions and demographic factors that lead to the advanced need of protein and fat components in the diet, and higher consumption rates of protein, fat, carbohydrates, vitamins, macro-and micronutrients (Hasnulin et al, 2006).
- (ii) Forecast of the demand and changing needs of the population of the northern territories should be carried out within the territorial information subsystem of agrifood system. The industrial development of the region will lead to dramatic increase of population and, hence, the increase in food consumption. To predict changes in food consumption the special information system must be developed (Zalivcheva, 2013).
- (iii) Major role in collecting data regarding population needs for food, information analysis and forecasting of changes in the needs of the population in food should be played by regional authorities and local authorities. Currently local authorities do not monitor population's requests for food, forecast of food needs is absent, and that can lead to food shortages.
- (iv) Food supply should be divided on internal and external sources of food, because regional food security depends mostly on external sources of food. Supply from external sources of food must be monitored by the local government to avoid food shortages.
- (v) Local internal food production should be focused on agricultural production, which has specific qualities that can be used to justify premium pricing and higher

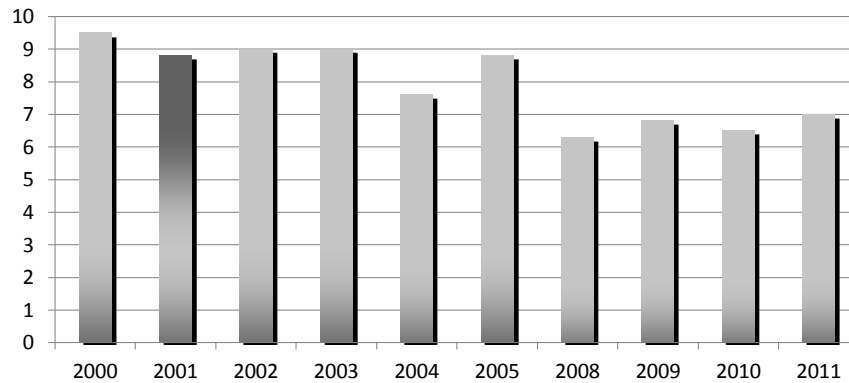


Figure 1. Decrease of the rural population of sverdlovskaya oblast in Russia (%).

production costs.

(vi) Rural settlements in northern regions should be developed on the principle of multi-functional development, that is, agricultural production should not be the sole source of income for rural population.

(vii) Income levels and living standards of rural population must be comparable with the level of income and standards of living of the urban population that has a positive effect on the stability of socio-economic situation in rural areas.

(viii) Regional agrifood system must give social and economic benefits for all social groups of regional population. The effectiveness of agrifood system for urban population must be provided with better level of food security. The rural population must be provided with higher living standards.

In the process of agricultural development in the region local farms embed not only the new agro-technologies, but also new forms of management. The essence of the proposed approach to the creation of agrifood model system is to recognize the need for joint efforts of various participants in agricultural production and food market in order to effectively achieve the common goal of sustainable food security in the region.

Evaluation of the effectiveness of agrifood system in the region can be carried out within the framework of model based on the definition of functional relationship between the public welfare, efficiency of regional and local authorities under constraint of the limited resources available to local authorities.

Differences in the assessments of the performance of commercial organizations, government bodies and local governments arise from the difference of commercial organizations and bodies of the municipality or public authority in relation to human welfare. Considering the social welfare function (Arrow, 1950), we treat it as a set of individual utilities of all individuals constituting the population, thus, emphasizing that welfare can only be viewed as consisting of the welfare of individuals. Following this view, all actions of government bodies and

local authorities should aim to achieve justice, that is, to improve or at least preserve on the same level welfare of every member of society. This problem can be represented as maximization of social welfare functions by optimizing the not deterioration or individual well-being included in this feature.

Agri-innovative system model should be viewed as a model of provision of public goods or services. Public goods or services have no value; they are consumed for free, but have a cost, because the territorial government spends a certain amount of resources at its disposal to create public goods.

METHODOLOGY

Empirical model

The major demographic problem of the Sverdlovskaya oblast in Russia is deteriorated demographic situation in the rural territories, reduction in the employment of rural population, decrease in the volumes of agricultural production, and also decrease in the standards of living in the rural territories.

The following data clearly demonstrates the reduction in the public welfare in the rural localities of Sverdlovskaya oblast. Population loss was caused by migration to urban areas for better income. Demographic situation in the rural localities of Sverdlovsk region is characterized by the natural loss of permanent population since 1991, as depicted on Figure 1.

The represented information can be treated either as a trend or as a statistical set of values, with the mean value. By treating the level of natural loss as a trend, it is possible to project the linear forecasting, with $R^2 = 0.59$. The characteristics of a statistical sample will include the deviation $\sigma = 1.1$, and the average value $\bar{x} = -8.43$. The obtained results do not show sufficient evidence of the positive tendency of the level of the natural loss of rural population, but we may suppose the statistical fluctuations around the average value. The absence of positive tendency meaning the growth of the rural population of Sverdlovskaya oblast should be considered as stimulus to work out the model of the living standards improvement for rural territories. Previously neither such programs nor models were elaborated or they failed, otherwise the reduction of draining or an increase of the population in the rural regions must be displayed.

To understand types of rural settlements, they were grouped according to the number of inhabitants as it is given in Table 1.

Table 1. Groups of the rural localities according to the number of inhabitants in 2011.

Population of rural locality	Number of rural locality	Total population of rural locality
0	138	-
1-5	134	392
6-10	71	562
11-25	140	2487
26-50	165	6119
51-100	221	16320
101-200	271	38811
201-500	324	104286
501-1000	204	146093
1001-2000	100	137306
2001-3000	33	80177
3001-5000	22	85234
More 5000	20	136037
Total	1843	753824

The depicted distribution clearly demonstrates that two types of rural settlements could be marked out. The first type of rural settlements can be described as the settlements of mainly agricultural economy; this is the prevailing type in the range from (1 to 5) to (2001 to 3000) with the peak value in the category (501 to 1000) of the total number of inhabitants. The larger populated areas can be described as settlements of mostly industrial directivity. The unemployment level in the rural localities of the first type is characterized the following negative tendencies:

- (i) Persisting low level of the remuneration for labor, from one side, the expansion of demand for the labor with extremely low compensation, and with another - unwillingness of local inhabitants to work for offered salaries (about 60 euros per month)
- (ii) Increasing of the informal of-the-record employment without taxes and social security
- (iii) Insufficient demand for qualified workers with simultaneous scarcity of qualified labor force on the local labor markets because of the poor professional qualification of rural inhabitants and low working mobility of population
- (iv) Presence on the market of the significant contingent of young people (20 to 30 years), with low general education level, that considerably complicates the problem of their job placement
- (v) Increase in the tension on the labor market. Tending low competitive ability on the market of labor of the separate categories of inhabitants (young people without the practical work experience, women with young children, handicapped persons) caused by the objective stiffening of the demands of employers.

More than 25 000 people in average were permanently unemployed in rural localities during the period of 2009 to 2011, the average level of unemployment in the rural localities composed 3.5%. In spite of being increased rural unemployment, the growth of agricultural production in Sverdlovskaya oblast in 2011 comparatively to 2010 increased by 23.4% in the actual prices, and in the comparable prices increase composed 2.7%.

Two factors influenced the described increase of agricultural production: negative - an inflationary rise of the global food prices and positive - an increase of labor productivity in the agricultural organizations of the Sverdlovskaya oblast.

Sverdlovskaya oblast has the expressed industrial background of its economy with the high concentration of urban population (rural population is only 16% of the whole population, as it was noticed earlier. This situation requires the highly intensified agricultural

production, mostly of that consumed in the fresh form.

According to the statistical data, the average number of workers of an industrial enterprise in the region comprises of 150 workers. For rural localities the most common type of enterprises is small and medium enterprises (SME) with the number of workers up to 100 people enterprises linked with agricultural production, and forest industry, hence in order to support rural localities economy, by regional and local authorities should be primarily support SME. To ensure the balanced development of rural localities on the basis of the creation of worthy conditions for the life and the activity of population, it is necessary to solve the major tasks:

- (i) Creation of the self-developing economic systems in rural localities.
- (ii) Increase in the attractiveness of migration to rural localities.

In accordance with the Pareto condition to achieve the objective of raising the level of food security for Sverdlovskaya oblast, it was proposed to increase the welfare of rural population by social development in rural localities and economic growth of agricultural production. The suggested model presumes the attraction of the additional funding from the federal, regional, local authorities, and private investments to increase the welfare not only of the separate categories of the population of Sverdlovskaya oblast, but practically for all population groups.

The effectiveness of suggested model should be evaluated as its influence on the improvement of social and economic situation in the rural locality of Sverdlovsk region, a change in the migratory processes. The effectiveness of the model can be evaluated wider, since its realization positively influences not only rural population, but also to the urban population.

RESULTS

Results show that, the current trends of agricultural production and rural social development in Sverdlovskaya oblast are degrading. To reach the goal of regional food security and to change declining trends in production, it is necessary to ensure the priority of social goals over economic development, because providing higher standards of rural livelihoods will inevitably lead to

the sustainable development of agricultural production. The study determined the conceptual foundations of the transition of rural localities of industrial region of Russia towards sustainable development through the creation of decent living conditions and activities of the rural population in quality food production. Particular attention is focused on the mechanism of interaction and coordination among federal and regional governments, local governments, and commercial organizations engaged in its food production activities in rural areas. On the basis of theoretical propositions the conceptual model of innovative development of rural areas in an industrial region, namely Sverdlovskaya oblast of Russia, aiming quality food production for the population of region is presented.

DISCUSSION

The suggested model can be treated as a model of the agro-innovation system of the industrial northern region, since the principles, assumed as the basis of the model, can be acknowledged as fundamental for any industrial region.

The expected outcome after the realization of the agro-innovation model is the increase of food security for the population of Sverdlovskaya oblast and the increase of living standards for rural population due to realization of the following principles.

The first principle is the proposition that, the agro-innovation system must consider the interests of all social groups of industrial region; it has to be directed toward an increase in the public welfare for all groups of population of the region.

The second principle offers that, the model has to be directed toward the development of the special features of the agricultural producers of Sverdlovsk region, but not to attempt competition with the external producers.

The third principle is that, the model sets its goals not on the change of benchmarks for the development of Sverdlovskaya oblast, but to strengthen the economic growth of region due to improvement of the quality of the food supply for the population of Sverdlovskaya oblast.

The fourth principle is that, the model develops not only economic potential of rural territories, but first of all social growth. The model points out the importance of the multifunctional development of rural localities, what in turn obligatory affects the improvement of standards of living in the rural localities in Sverdlovskaya oblast.

The model of regional agro-innovation system was introduced to the regional government and it was found prospective for the realization in Sverdlovskaya oblast as a mandatory part of the regional program of innovative development of Sverdlovskaya oblast.

The weak side of the realization of the suggested model is possibly the lack of political will of the local authorities. The current political system in Russia does not give adequate authorities to municipal administrations.

In order to implement this model, it is required that, municipal administrations will take political responsibility for living standards level and food security of population.

The increase of the migration to rural localities, provoking it by creating jobs in agrifood enterprises, the creation of the favorable rural society will lead to the long-term stable regional economic development. Thus, the model of agrifood system developed for Sverdlovskaya oblast, satisfies the basic conditions of the model of the agro-innovation system of the industrial region and can be disseminated to other northern industrial regions of Russian federation.

CONCLUSION AND RECOMMENDATION

The study result shows that, despite the highly centralized economic policy in Russian federation, the regional food security and rural development can be reached by active role of municipal authorities and entrepreneurs. To ensure entrepreneurial activities of rural producers the regional government must develop regional agrifood system into agro-innovation system, with information system as the core.

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