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THE LEVEL AND QUALITY OF INCLUSIVE GROWTH AGRI-FOOD SYSTEM IN MODERN CONDITIONS

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Abstract

With regard to the agri-food system, the theoretical and methodological basis for the study of inclusive development has been substantiated. The study reveals the concept of inclusive development of the agri-food system, substantiates criteria and indicators, and proposes assessment methods. New risks associated with the COVID-19 pandemic are analyzed in the development of the agro-food system, which has aggravated the existing systemic problems and negatively affected the quality of life of Russians. A comparative analysis of the quality of inclusive development of the agri-food systems of the Saratov region and Russia in the context of the main blocks: growth and development, the fairness of distribution of public goods between all strata and groups of the population, the involvement of all forms of management, food security, environmental sustainability. An integral indicator of the level and quality of inclusive development of the agri-food system of Russia and the Saratov region was calculated. Measures are formulated to facilitate the transition of the agri-food system to an inclusive development model and overcome negative trends in the post-pandemic economy.

Key words**:** *model of inclusive growth, agri-food system, sustainable development, food security, post-pandemic economy*

INTRODUCTION

At the present stage, the COVID-19 pandemic has become a serious challenge to the sustainable development of the agri-food system both in Russia and around the world. New risks were actualized related to food supply chain disruptions; with the vulnerability of small forms of agribusiness, including the self-employed; with trade restrictions and problems in the operation of transport and logistics infrastructure; with an increase in the financial burden on the budgets of the federal and regional levels; with a change in demand for food products due to a decrease in the level of income and quality of life of the population. In the context of uncertainty, global and national challenges, the problem of choosing adequate models for the modernization of the agrarian economy, preventing a decrease in the sustainability of socio-economic development, becomes especially urgent. An inclusive model of economic development meets the requirements of modern realities.

The transition to an inclusive model is actively discussed by the world community. This model not only corresponds to the paradigm of sustainable growth and is aimed at solving key systemic problems in the face of great challenges. The transition of the agri-food system of Russia to an inclusive growth model will be aimed at solving the spectrum of problems that have accumulated in recent decades. Among such problems, it is advisable to note the following:

- inconsistency of the technological level of development of the material and technical base of the agrarian sector of the economy with current world trends;
- low level of labor productivity and qualifications of the labor force, associated with insufficient investment in human capital;

- a significant differentiation of population groups by the level of physical and economic availability of food;
- social polarization, exacerbation of social problems and depopulation of rural areas, etc.
- ineffectiveness of competition mechanisms, self-regulation, public administration, asymmetric support.

In the current conditions, it is the inclusive model of development of the agri-food system that contributes to attracting all resources and activating the institutions of innovative development; fair distribution of public goods, taking into account the interests of all strata and groups of the population; ensuring not only self-sufficiency in the provision of food but also its economic and physical accessibility; reduction of the level of poverty of welfare not only in the short-term but also in the long-term period [8].

In a post-pandemic economy, in order to ensure food security, transform food chains, and increase the sustainability of the agro-food system, it is advisable to form the inclusiveness of the agri-food system and improve the quality of life of the rural population to reduce poverty, preserve and develop small forms of agribusiness. Updating research related to the substantiation of a new concept of socio-economic development of agri-food systems involves analyzing and assessing the level and quality of inclusive growth at all levels of management, which will allow identifying priority areas of sustainable development and developing a methodology and tools for achieving strategic goals in operating economic institutions of our time [5].

At present, world science has accumulated a wealth of experience in research on the inclusive development of the economy, including many theoretical approaches and methodological provisions proving the existence of a significant connection between the rates of economic growth and the solution of a wide range of social problems [4]. The methodology for assessing the level of inclusive development is presented in the studies of such international organizations like the UN, IMF, OECD, the World Bank, etc. The model of inclusive development is relevant in the context of studying the problems of sustainable development and the transition to a “green economy” based on innovation and structural reforms.

FAO has developed a series of social protection policies for the poor to ensure inclusive sustainable growth in the agricultural sector of the economy [15, 29].

According to foreign researchers, sustainable development is a process that preserves the basic determinants of the territorial system and ensures a balance of economic, social, and environmental measures [13, 31].

Modern economists Acemoglu D., Robinson J.A. outlined the essence of the concept of "inclusiveness" using the terms extractive and inclusive [1].

The studies were based on evolutionary, institutional, systemic, and logical approaches, which made it possible to comprehensively assess the interaction of extractive and inclusive institutions. Inclusive development is based on scientific and technological progress and innovative growth [7].

Inclusive development models are effective for both developing and developed countries. For countries that are considering hidden opportunities for economic growth, inclusive development is an effective tool for the transition from imitation to an innovative model of economic development [2, 18].

Inclusive development of the agri-food system provides the ability to manage social, environmental, geopolitical risks with a high degree of efficiency [17]. In the context of the digital transformation of the economy, special attention deserves the study of the relationship between inclusive development and the use of digital methods and means in agricultural production [19].

The transition to an inclusive model of socio-economic growth aimed at increasing growth rates is possible provided the expanded use of the totality of resources, including human resources [16, 20].

A new round of interest in this issue is associated with overcoming the consequences of the COVID-19 pandemic. This is how FAO unveils a new response agenda that aims to create new and strengthened partnerships for

international food and agricultural responses that support the country, regional, and global efforts to combat hunger and malnutrition. To limit the impact of the pandemic, recover and accelerate progress towards the Sustainable Development Goals (SDGs), key priority areas have been identified, including economic inclusion and social protection for poverty alleviation, improving trade and food safety standards, making smallholder farmers more resilient to recovery, preventing next zoonotic pandemic [14,26].

We believe that the model of inclusive development is also relevant to the agri-food system. However, the specificity of this sphere of the economy presupposes adaptation of the existing theoretical and methodological basis for the study of inclusive growth (including the concept, criteria, indicators, assessment methods, etc.). Considering the special social significance of the agri-food system, a feature of the inclusive model of its development should be an orientation towards human interests, towards achieving not only self-sufficiency of food supply but also the physical and economic accessibility of food to all segments of the population. It is from these positions that economic, social, political transformations in the agricultural sector of the economy should be assessed [10].

MATERIALS AND METHODS

The methodological basis of the research is the works of Russian and foreign economists in the field of research on sustainable development of the agri-food complex based on the concept of inclusive growth.

In order to analyze and assess the level and quality of inclusive processes, foreign scientists have formulated key and institutional performance indicators [3, 21].

Key indicators of inclusive economic development according to the index of inclusive development according to the World Economic Forum (WEF) are growth and development; inclusion; fairness and sustainability between generations. WEF calculates indicators considering the dynamics of GDP growth, labor force participation in labor productivity and life expectancy; average household income, poverty, and others [27].

The study of foreign experience has revealed different points of view on the main provisions of the concept of inclusive development at the macro, middle, and micro levels. So, at the macro level, inclusive development is assessed by such indicators as an increase in the average living standard of the population, an increase in the average real income per capita, and equal access of all segments of the population to public goods [6, 25].

The concept of inclusive development is associated with the transformation of the priorities of agri-food policy. To assess the effectiveness of existing policies, it is necessary to form a system of indicators and indicators to assess the level and quality of inclusive growth.

We consider it necessary to include five blocks of indicators in the system of indicators of inclusive development of the agri-food system. The first block, which characterizes growth and development, the role and place of the agricultural sector in the country's economy, the efficiency of using human capital, includes the following indicators:

gross added value of agriculture per capita as a percentage of GDP,%;

labor productivity in agriculture as a percentage of the average for the economy,%;

change in the share of profitable organizations of the current year to the previous one, %;

change in the number of people employed in agriculture of the current year to the previous one, %;

change in the level of employment of the rural population of the current year to the previous one, %.

The second block of indicators aimed at assessing the harmony of resource sharing between different segments of the population includes the following indicators:

- the proportion of the population with money incomes below the subsistence minimum of the total population,%;
- the ratio of the median income to the average per capita income of the entire population,%;

-the ratio of average monthly wages in agriculture to wages in the economy as a whole,%;
-change in the number of rural percent of the population of the current year to the previous year,%
-population income concentration index (Gini coefficient);
-the level and structure of state support for the development of rural areas, including social and engineering infrastructure;
-subsidies for sustainable development of rural areas per 1 rural resident, rub.
The third block of indicators characterizes the involvement of all forms of management, including small agribusiness, in the formation of food resources. The following indicators can be used as such:
-arable land area for the total number of peasant farms (KFH) and individual entrepreneurs (IP), ha;
-the share of small agribusiness in the production of basic types of food;
-the amount of state support for small agribusiness;
-the share of peasant farms and households in the production of the main types of agricultural products (grain, potatoes, vegetables, livestock and poultry, milk), %.
A special place in assessing the inclusive development of agri-food systems belongs to the indicators of the fourth block, characterizing the level of food independence, physical and economic accessibility of food [23].
This group includes the following indicators:
-the level of self-sufficiency of the population with food (the ratio of the level of production and consumption for the main types of food), %;
-the level of physical availability (the ratio of the actual level of consumption of basic types of food to the recommended standards), %;
-the level of economic accessibility of food (the share of food costs in consumer spending), %.
Indicators of environmental sustainability, which constituted the fifth block of indicators of inclusive development, are no less important for assessing the inclusive development of the agri-food system. These include indicators:
-the proportion of organizations that carried out innovations that ensure an increase in environmental safety in the production of goods, works, services, %;
-emissions of pollutants from stationary sources;
-the proportion of captured and neutralized air pollutants escaping from stationary sources, %;
-greenhouse intensity of agricultural production (carbon dioxide emissions per ruble of GVA);
-use and disposal of production and consumption waste;
-index of the physical volume of environmental expenditures (in comparable prices); in% to the previous year;
-investments in fixed assets aimed at environmental protection and rational use of natural resources, per 1 rub. GRP, RUB.
With the help of the presented methodological approach, it is possible to assess the level of inclusive development both at the federal and regional levels, which will allow ranking and rating of agri-food systems at the regional level, to carry out their typology to improve the existing agri-food policy [11].

RESULTS AND DISCUSSIONS

Inclusive development of the agri-food system is a process of economic, social, institutional transformations aimed at creating non-discriminatory conditions, including the possibility of participation of all actors in the processes of production, distribution and consumption of food, as well as access of all groups of the population to social infrastructure, provided that decent quality of life (including nutrition) of the population as a whole and its individual groups [22].
Approbation of the methodology for assessing the inclusive development of the agri-food system was carried out on the example of such a region as the Saratov region. The indicators presented in table 1 make it possible to identify the Saratov region as an agrarian region. According to the indicator "Share of agricultural production per capita" Saratov

region is more than 1.4 times higher than the average for Russia. The share of agricultural products in Russia's GDP is 3.5%, and in the Saratov region this value is 15.3%. It should be noted that there is a difference in the dynamics of this indicator: if in the Russian Federation the share of agricultural products in GDP in 2016-2018 decreased by 1.43 times, then in the Saratov region a slight increase is evident.

Table 1. Indicators of inclusive development of the agri-food system of the Saratov region for the block «Growth and Development»

Indicators	Subjects	2016	2017	2018
Agricultural production per capita, thousand rubles	Russia	34.9	34.9	36.4
	Saratov region	57.1	54.5	52.5
Share of agricultural products in GDP (GRP),%	Russia	5.0	4.6	3.5
	Saratov region	14.2	12.3	15.3
Labor productivity in the economy, thousand rubles / person	Russia	1,188.0	1,278.4	1,458.0
	Saratov region	565.7	618.5	686.2
Labor productivity in agriculture, thousand rubles / person	Russia	933.8	1,008.9	1,083.5
	Saratov region	1,291.0	1,506.4	1,677.6
Labor productivity in agriculture as a percentage of the average for the economy, %	Russia	78.6	78.9	74.3
	Saratov region	228.2	243.6	244.5
Change in the share of profitable organizations of the current year to the previous one, %	Russia	100.1	97.4	100.4
	Saratov region	108.4	94.4	105.9
Change in the number of people employed in agriculture this year to the previous year, %	Russia	99.54	92.57	97.28
	Saratov region	92.20	81.45	85.94
Change in the level of employment of the rural population of the current year to the previous one, %.	Russia	100.0	88.5	100.4
	Saratov region	101.7	82.5	95.1
Change in the volume of investments in agriculture, the current year to the previous, %.	Russia	123.2	102.8	112.9
	Saratov region	160.0	90.9	91.4
Integral indicator for the block "Growth and Development"	Russia	**1.000**	**0.961**	**0.973**
	Saratov region	**1.000**	**0.908**	**0.993**

Source: Own determination.

The analysis of such an important indicator characterizing the efficiency of economic development as labor productivity deserves attention. If labor productivity on average in the economy of the Saratov region is lower than the average Russian level, then labor productivity in agriculture in the region is significantly higher than that in Russia.

At the same time, the ratio of labor productivity in agriculture and the economy as a whole in the Saratov region and Russia is fundamentally different. So in the Saratov region, labor productivity in agriculture is almost 2.5 times higher than the average for the regional economy. In the Russian Federation, the differentiation between similar indicators is not so pronounced.

However, the positive dynamics of labor productivity in agriculture in the Saratov region can be explained not so much by an increase in production as by a sharp decrease in the number of employed.

Causes certain caution and a significant decline in investment in agriculture. Despite the increase in this indicator in the agriculture of the Russian Federation, in the Saratov region over the past few years, there has been an almost ten percent annual decline. We believe that this is a significant obstacle to the inclusive development of the region's agri-food system.

Analysis of the integral indicator for the block "Growth and development of the agri-food system" of the author's methodology characterizes the stable position of the Saratov region.

At the same time, the existing model of socio-economic development is characterized by the differentiation of the level of income and life of the rural and urban population.

The proportion of the population with incomes below the subsistence level in the countryside is more than three times higher than the urban level. In 2018, the average monthly nominal accrued wages in agriculture

amounted to 65.6% of the average for the economy (Table 2).

Table 2. Indicators of inclusive development of the agri-food system of the Saratov region for the block «Equity in the distribution of public goods»

Indicators	Subjects	2016	2017	2018
The proportion of the population with money incomes below the subsistence level of the total population, %	Russia	13.3	13.2	12.9
	Saratov region	17.4	16.8	16.1
The ratio of the median income to the average per capita income of the entire population, %	Russia	74.71	74.84	74.61
	Saratov region	79.90	80.65	79.88
The ratio of average monthly wages in agriculture to wages in the economy as a whole, %	Russia	59.3	65.5	65.6
	Saratov region	68.0	70.4	70.0
Income concentration index (Gini coefficient)	Russia	0.412	0.411	0.413
	Saratov region	0.365	0.365	0.362
Change in the rural population of the current year to the previous one, %	Russia	99.7	99.4	99.4
	Saratov region	99.0	98.6	98.2
The share of subsidies in the direction of "Sustainable development of rural areas" in the total volume of state support, %	Russia	7.8	7.9	10.2
	Saratov region	5.1	6.0	2.0
Share of subsidies for improving the housing conditions of citizens living in rural areas, in the amount of financing for sustainable development of rural areas, %	Russia	46.5	48.7	49.5
	Saratov region	0.0	30.2	18.4
The share of subsidies for the complex arrangement of social and engineering infrastructure in settlements located in rural areas, financing of sustainable development of rural areas, %	Russia	52.5	26.9	22.9
	Saratov region	100.0	61.2	53.2
Subsidies for sustainable development of rural areas per 1 rural resident, rubles	Russia	417.0	364.6	319.2
	Saratov region	198.0	256.0	58.6
Integral indicator for the block "Fairness of distribution of public goods"	Russia	**1.000**	**0.918**	**0.916**

Source: Own determination.

For a number of indicators of the direction "Fairness of distribution of public goods" Saratov region is inferior to the Russian Federation. The population with a specific income below the subsistence level is more than 20% above the national average. The level of concentration of income of the population, using the Gini coefficient, remained practically unchanged, which may indicate a stable situation in the distribution of income.

This is confirmed by the smaller gap in the level of wages in agriculture and in the regional economy as a whole. The low level of wages in agriculture, which is almost a third lower than the average wage in the economy, does not contribute to the solution of social problems in the countryside.

The following reasons impede the fair distribution of public goods: inconsistency of all levels of rural management; lack of effective mechanisms for overcoming poverty, inequality, and unemployment in rural areas; underdeveloped rural infrastructure and poor staffing; poor diversification of the rural economy and an insufficient level of development of non-agricultural activities; insufficient entrepreneurial activity and low efficiency of measures of state support for the development of rural areas [12]. In the structure of state support for the development of the agro-industrial complex, the share of subsidies in the direction of "Sustainable Development of Rural Areas" was in 2018 in the Russian Federation - 10.2%, and in the Saratov region - 2%. At the same time, subsidies for sustainable development of rural areas in 2018 in the Russian Federation amounted to 319.2 rubles per one rural resident and only 58.6 rubles in the Saratov region.

There is reason to believe that the use of an inclusive model helps to solve these problems. Inclusive growth means the involvement of not only high-tech sectors of the economy but also the agricultural sector in the process of modernization and innovative development of the Russian economy, which will diversify sources of income, create decent jobs, ensure the availability of social protection means and expand the opportunities of the rural population. These questions are important in

informing pro-poor agri-food policies, strategies, and programs. We believe that such an approach will contribute to the inclusive growth of the agri-food system and sustainable development of rural areas.

The assessment of the indicators of the involvement of all forms of management in the formation of food resources made it possible to conclude that the institutional structure of the agri-food system of the Saratov region is quite stable (Table 3). A large contribution to the formation of food resources belongs to peasant farms in the Saratov region, the share of which in agricultural production reaches almost one third, which is almost three times higher than the same indicator in Russia. The maximum contribution of peasant farms in the Saratov region is made in the formation of resources for crop production (cereals and legumes, sunflower, vegetables).

Table 3. Indicators of inclusive development of the agri-food system of the Saratov region for the block «Involvement of all forms of management in the formation of food resources»

Indicators	Subjects	2016	2017	2018
Share of agricultural products of peasant (farmer) households, %	Russia	11.1	12.1	12.4
	Saratov region	30.2	30.6	28.9
The share of peasant (private) households in the sown area, %	Russia	27.7	28.9	29.7
	Saratov region	21.5	21.9	22.8
Share of peasant farms in the production of cereals and legumes, %	Russia	27.7	29.1	29.0
	Saratov region	49.7	49.9	51.3
Share of peasant farms in the production of sunflower for grain, %	Russia	30.9	31.5	33.2
	Saratov region	45.2	44.2	47.5
Share of peasant farms in vegetable production, %	Russia	18.1	19.0	18.7
	Saratov region	41.9	41.5	40.1
Share of peasant farms in livestock and poultry meat production in slaughter weight, %	Russia	3.0	3.0	3.0
	Saratov region	5.8	6.1	6.2
Share of peasant farms in milk production, %	Russia	7.3	7.9	8.2
	Saratov region	6.1	6.2	8.2
Share of households in total potato production, %	Russia	69.4	68.9	68.0
	Saratov region	88.2	88.7	89.5
The share of households in the total production of vegetables, %	Russia	58.6	55.4	55.1
	Saratov region	36.1	33.2	34.5
Share of households in the total volume of livestock and poultry meat production (slaughter weight), %	Russia	20.8	19.1	18.0
	Saratov region	59.1	53.8	52.1
Share of households in the total milk production, %	Russia	42.1	40.2	38.7
	Saratov region	77.6	77.1	75.6
Share of households in total egg production, %	Russia	19.6	18.8	18.5
	Saratov region	44.1	45.2	47.6
Integral indicator for the block "Involvement of all forms of management in the formation of food resources"	Russia	**1.000**	**1.007**	**0.999**
	Saratov region	**1.000**	**0.993**	**1.033**

Source: Own determination.

A feature of the agri-food system of the Saratov region is the dependence of the formation of food resources on the production of livestock products in households. This sector in the Saratov region provides more than three-quarters of the milk produced, more than half of the volume of livestock and poultry meat produced, and more than 40% of eggs.

The calculation of the integral indicator for the block "Involvement of all forms of management in the formation of food resources" revealed that the agri-food system of the Saratov region is characterized by a multitude of structures and the involvement of all groups of farms in the formation of food resources. Recognizing the priority of the formation of the country's food resources by large agricultural enterprises, we believe that small agribusiness should occupy a certain niche, creating conditions for sustainable development of rural areas. Prospects for the

development of small businesses are due to the implementation of such public services as the production of environmentally-friendly (or organic) products, reducing the load on natural ecosystems, preserving rural culture and traditions, and sustainable development of rural areas.

The development of the potential of regional producers of all forms of farming, including small agribusiness, will increase the volume of food supplies, as well as meet the needs of the population in nutrition in proportion to the level of income of all segments of the population. Analysis and assessment in the direction of "Food security" presented in Table 4 include indicators reflecting the level of self-sufficiency, as well as the physical and economic accessibility of food.

According to the results of the calculations, it can be concluded that for meat and meat products, potatoes, and eggs, the self-sufficiency coefficient exceeds 100% in Russia. In the Saratov region, this figure exceeds 100% for milk, potatoes, vegetables, and eggs and exceeds the national average. However, the region is characterized by a downward trend in self-sufficiency in meat and meat products from 2016 to 2018.

Table 4. Indicators of inclusive development of the agri-food system of the Saratov region for the block «Food security»

Indicators	Subjects	2016	2017	2018
Self-sufficiency indicators (ratio of production to consumption)				
Self-sufficiency coefficient in meat and meat products	Russia	0.988	1.019	1.043
	Saratov region	0.976	0.934	0.891
Self-sufficiency ratio for milk and dairy products	Russia	0.879	0.894	0.908
	Saratov region	1.233	1.247	1.297
Potato self-sufficiency coefficient	Russia	1.702	1.642	1.719
	Saratov region	1.043	1.056	1.035
Coefficient of self-sufficiency in vegetables and melons	Russia	0.881	0.891	0.869
	Saratov region	1.452	1.451	1.438
Egg self-sufficiency ratio	Russia	1.087	1.094	1.093
	Saratov region	1.253	1.215	1.187
Integral indicator of food self-sufficiency	Russia	**1.072**	**1.078**	**1.091**
	Saratov region	**1.180**	**1.168**	**1.153**
Indicators of physical accessibility by food groups (the ratio of the actual consumption to the rational rate)				
Sufficiency ratio of consumption of meat and meat products	Russia	0.932	0.945	0.945
	Saratov region	0.699	0.726	0.753
Sufficiency ratio of milk and dairy products consumption	Russia	0.711	0.708	0.705
	Saratov region	0.711	0.711	0.714
Potato consumption sufficiency ratio	Russia	1.000	1.000	0.989
	Saratov region	0.644	0.633	0.633
The coefficient of sufficiency of consumption of vegetables and melons	Russia	0.729	0.743	0.764
	Saratov region	0.729	0.750	0.750
Egg consumption sufficiency ratio	Russia	1.050	1.073	1.077
	Saratov region	1.215	1.231	1.215
Integral indicator of sufficiency of food consumption	Russia	**0.873**	**0.882**	**0.885**
	Saratov region	**0.777**	**0.787**	**0.791**
Economic affordability of food (food costs in consumer spending of households),%	Russia	35.5	31.2	30.2
	Saratov region	43.8	42.2	38.7
Integral indicator for the block «Food Security»	Russia	**1.000**	**0.850**	**0.845**
	Saratov region	**1.000**	**0.829**	**0.802**

Source: Own determination.

The indicator of physical accessibility by food groups was calculated as the ratio of the actual volume of consumption to the national rate. The integral indicator of the sufficiency of food products in the Saratov region is more than 10% lower than in Russia. The greatest lag behind the rational nutritional norm was found in the consumption of meat, milk, vegetables. According to the results of calculations for Russia, the most important physical accessibility of food is meat and meat products, potatoes, eggs. The coefficient

of sufficient consumption in the Saratov region exceeds 100% only for eggs. The indicator of the affordability of food, calculated as the share of food expenditures in the structure of total consumer spending, does not coincide with the indicator of the physical availability of food. So, the Saratov region is characterized by high costs for food products, which are almost 10 percentage points. exceeds the average Russian level.

Factors affecting food security include the level of technological development of the food industry, the state of the logistics infrastructure, the level of income of the population, and the quality of life. The analysis of the agri-food system of the Saratov region revealed paradoxical contradictions: on the one hand, the region is characterized by a high level of agricultural development, and on the other hand, low indicators of the physical and economic accessibility of food. These contradictions do not fit into the trends of national agricultural development and contradict the concept of inclusive development. In our opinion, territories that make a large contribution to the formation of food resources should have the necessary level of physical and economic accessibility of food. Solving the problems of inclusive development involves not only ensuring high rates of economic growth, taking into account social constraints but also harmonizing economic dynamics with environmental imperatives. Within the framework of the concept of inclusive development, many problems have a complex solution due to the interaction of economic, social, and environmental factors, which leads to the emergence of multiplier effects and predetermines a new quality of the inclusive growth model.

The last decades have enriched the concept of sustainable development, complementing it with new goals and guidelines. For example, the need is ripe and there is a real opportunity for the transition to a "green economy", which implies strict adherence to the norms of environmental safety and resource conservation. Indicators of inclusive development of the agri-food system for the block "Environmental sustainability" are shown in Table 5.

Table 5. Indicators of inclusive development of the agri-food system of the Saratov region for the block «Environmental sustainability»

Indicators	Subjects	2016	2017	2018
GRP water capacity (the ratio of the volume of water intake to the produced GRP), cubic meters/1 million rubles. GRP	Russia	638.2	582.2	507.6
	Saratov region	681.0	671.1	622.0
Specific emissions of air pollutants from stationary and mobile sources, ton/1 thousand rubles GRP	Russia	369.3	349.2	309.8
	Saratov region	572.5	562.4	518.2
Specific discharge of contaminated wastewater into surface objects, cubic meters/1 rub. GRP	Russia	171.9	148.0	125.9
	Saratov region	20.2	14.9	128.7
The share of captured and neutralized air pollutants in the total amount of waste pollutants from stationary sources,%	Russia	73.9	74.4	73.3
	Saratov region	74.2	76.0	68.5
Utilization and neutralization of waste in the total volume of generated production and consumption waste, %	Russia	59.6	52.2	52.6
	Saratov region	13.0	13.6	15.5
Index of the physical volume of environmental protection costs (in comparable prices; in% to the previous year)	Russia	92.8	102.7	98.6
	Saratov region	99.0	130.0	80.5
Investments in fixed assets aimed at environmental protection and rational use of natural resources, per 1 rub. GRP, rub	Russia	1631	1677	1511
	Saratov region	231	2142	680
Investments in fixed assets aimed at environmental protection and rational use of natural resources, per 1 rub. GRP, rub	Russia	788.0	1677.2	601.4
	Saratov region	83.8	301.6	240.4
Investments in fixed assets aimed at the protection and rational use of land, per 1 rub. GRP, rub	Russia	142.8	111.2	95.9
	Saratov region	90.5	66.7	26.3
Integral indicator for the block «Environmental sustainability»	Russia	**1.000**	**1.094**	**0.904**
	Saratov region	**1.000**	**1.539**	**0.590**

Source: Own determination.

In the Saratov region in 2018, the total volume of pollutant emissions (including emissions from railway transport) amounted to 382.4 thousand tons, which is 1.6% more than in 2017. Emissions from stationary sources in 2018 amounted to 118, 0 thousand tons, compared to 2017, decreased by 3.75%. Emissions from road transport amounted to 259.2 thousand tons, compared with 2017 increased by 4.2% [28].

In comparison with the average Russian level, the indicators of the environmental sustainability of the Saratov region indicate a deterioration in the quality of the natural environment and the ecological conditions of human life. Freshwater withdrawal in 2018 amounted to 835.7 million cubic meters, which is 4.0% less than in 2017. Despite the fact that for the period 2016-2018. indicators of water intake per 1 rub. GRP produced in the Saratov region improved by almost 10%, they are 23% behind the average for the Russian Federation. A similar trend is also true for the indicator of the emission of air pollutants from stationary and mobile sources, only the lag from the average level increases by 67%.

The amount of waste generated in the Saratov region in 2018 amounted to 6.561 million tons and, compared to 2017, decreased by 2.8%. The amount of recycled waste in 2018 amounted to 0.884 million tons, which is 23.6% higher than in 2017. The amount of neutralized waste in 2018 increased by 53.3% over the year. It should be noted that the share of captured and neutralized air pollutants in the total amount of waste pollutants from stationary sources in the Saratov region and the Russian Federation are close both in terms of their values and to the target indicators of the state program "Environmental Protection". The determining factors of such a relatively favorable situation in this case were: insignificant rates of economic growth, modernization of production processes, accompanied by a decrease in the number of pollutants formed, the use of more environmentally “cleaner” fuels or raw materials. It is characteristic that for the type of activity "agriculture, hunting and forestry" there was an increase in the amount of captured/neutralized pollutants by 3.5 times.

Particular importance in the analysis of environmental sustainability should be given to the structure and dynamics of costs. In the Saratov region, the index of the physical volume of environmental expenditures (in comparable prices) in 2018 amounted to 80.5% of the level of 2017, although on average in the Russian Federation such a decline was not observed.

Investments in environmental protection in 2018 in the Saratov region amounted to 501,988 thousand rubles. At the same time, in their structure, the most significant investments are in the protection of atmospheric air (55%) and water resources (35%).

The analysis confirms the need to change the development model and shift priorities towards increasing welfare and ensuring social justice while reducing risks to the environment. These requirements are met by the current concept of a "green" economy, ie. an economy focused on low carbon emissions, efficient use of energy and resources, conservation of biodiversity, reduction of anthropogenic pressure on the ecosystem, which meets the interests of the whole society. This model of economic development ensures the growth of income and employment not only through public but also private investment. It is important to note that agri-food policy should be aimed at increasing investment activity and maintaining the required level of targeted government spending. The concept of a “green economy”, combined with an inclusive model for the development of the agri-food system, can contribute not only to the preservation but even restoration or growth of natural capital as a key economic asset and the main source of public goods. This is of particular importance for the poor, whose sources of income and security depend on nature [24, 30].

The balance of economic, social, and environmental characteristics of the inclusive development of the agri-food system can be assessed based on the calculation of the integral indicator presented in Table 6. We

consider it important to analyze both the dynamics of indicators in the context of the identified blocks of indicators and the ratio of regional with the national average.

The study of economic growth rates testifies to the formation of negative trends both in Russia and in the Saratov region. At the same time, the depth of the decline in Russia on average is higher than in the Saratov region (by 2.1% in 2018). Economic growth in the Saratov region is largely based on the use of the absolute competitive advantages of the regional agrosystem. Economic growth rates are constrained by weak financial security, unfavorable investment climate, constraints on the part of population demand, low innovation susceptibility in the agricultural sector.

Table 6. Integral indicator of inclusive development agri-food system of the Saratov region

Indicator block	Subjects	2016	2017	2018	*Saratov region in% to RF*	
					2017	*2018*
Growth and development	Russia	1.000	0.961	0.973	*94.5*	*102.1*
	Saratov region	1.000	0.908	0.993		
Equity in the distribution of public goods	Russia	1.000	0.918	0.916	*108.7*	*78.3*
	Saratov region	1.000	0.998	0.717		
Involvement of all forms of management in the formation of food resources	Russia	1.000	1.007	0.999	*98.6*	*103.4*
	Saratov region	1.000	0.993	1.033		
Food security	Russia	1.000	0.850	0.845	*97.5*	*94.9*
	Saratov region	1.000	0.829	0.802		
Environmental sustainability	Russia	1.000	1.094	0.904	*140.7*	*65.3*
	Saratov region	1.000	1.539	0.590		
Integral indicator	**Russia**	**1.000**	**0.979**	**0.926**	*10.8*	*87.5*
	Saratov region	**1.000**	**1.028**	**0.810**		

Source: Own determination.

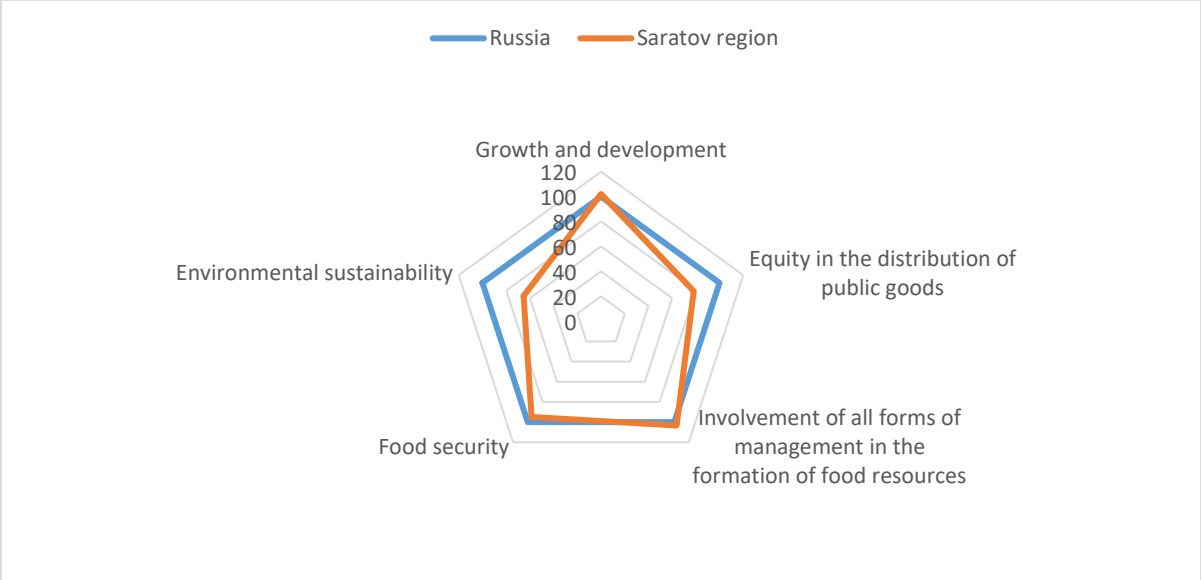

Fig. 1. The ratio of the integral indicator of inclusive development of the agri-food system of the Saratov region and Russia in 2018
Source: Own determination.

In the context of the identified blocks of indicators of inclusive development of the agri-food system, the following conclusions can be drawn. Relatively high values of inclusiveness indicators are typical for the blocks "Growth and development" and "Involvement of all forms of management in the formation of food resources", and the lowest values are typical for the blocks "Food security" and "Environmental sustainability".

The weakness of the state agri-food policy, which does not meet the criteria of inclusive development, as evidenced by the significant differentiation of the constituent entities of the Russian Federation in terms of the level of socio-economic development of regional agri-food systems. There are many reasons for this differentiation of regional development - from resource and financial security to the unfair distribution of public goods and the inequality of regions in the distribution of budget funds).

CONCLUSIONS

The model of inclusive growth as a modern paradigm for the development of the agri-food system can be considered a synthesis of the concepts of sustainable and innovative development, updated taking into account modern challenges. There is a shift in the center of gravity from quantitative and volumetric indicators towards qualitative and intensive characteristics. The importance of structural indicators is increasing, which makes it possible to assess the proportionality and balance of the ongoing changes. In the concept of inclusive development, the emphasis is shifting towards the environmental and social components. Therefore, the level of inclusive development should be assessed not only by the ability to ensure sustainable economic dynamics but also by the growth of the welfare of citizens and the solution of social and environmental problems.

The inclusive development model has already proven its effectiveness in developed economies. However, due to the peculiarities of the Russian institutional environment, the specifics of the agricultural sector, and its special social significance, the basic principles of the transition to the trajectory of inclusive development of the agri-food system should be:

- full involvement and effective use of all resources (especially human);
- focus on economic growth based on the activation of innovative activities of Russian enterprises [9];
- adherence to the requirements of environmental friendliness of production, which will effectively integrate into global food chains with products with high added value;
- compliance with the requirements of equity in the distribution of public goods and the principles of food security, including food independence, physical and economic accessibility of food for all segments and groups of the population.

The COVID-19 pandemic is an indirect driver of the development of a modern agri-food system. In this regard, it is advisable to implement a complex of short-term, medium-term, and long-term measures, such as:

- overcoming technical and technological backwardness in the system of Russian agricultural engineering;
- elimination of the lag behind the world level in the areas of production of plant protection products, veterinary drugs, selection and seed production, livestock breeding, etc .;
- preventing a decrease in budgetary support for all forms of agribusiness;
- social support for low-income families and implementation of a direct food assistance program for vulnerable groups of the population;
- development of a cooperative trade system along with large trade networks;
- transition to digital platforms for the development of the agri-food system.

In conclusion, we note that despite the aggravation of existing problems and the emergence of new risks in the post-pandemic economy, the Russian agri-food system has sufficient potential for sustainable development, provided that the model of inclusive growth is implemented.

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REFERENCES

[1]Acemoglu, D., Robinson, J.A., 2013, Economics versus Politics: Pitfalls of Policy Advice. Journal of Economic Perspectives. Vol. 27, № 2: 173–192.
[2]Agarwal, B., Dorin, B., 2019, Group farming in France: Why do some regions have more cooperative ventures than others? Environment and Planning, 51(3):781-804.
[3]Akhmetshin, E. M., Sharafutdinov R. I., Gerasimov, V.O., Dmitrieva, I.S., Puryaev, A.S., Ivanov, E.A., Miheeva, N.M., 2018, Research of human capital and its potential management on the example of regions of the Russian Federation. Journal of Entrepreneurship Education. 21(2): 96.
[4]Akpoti, K., Kabo-bah, A.T., Zwart, S.J., 2019, Agricultural land suitability analysis: State-of-the-art and outlooks for integration of climate change analysis. Agricultural Systems.№ 173, pp. 172-208.
[5]Andryushchenko, S.A., Vasilchenko, M.Ya., Derunova, E.A., Rubtsova, V.N, Sharikova I.N., 2018, Modeling of Structural and Institutional Factors of Development in Regions Unfavorable for Agriculture. The Journal of Social Sciences Research. №3. pp.40-43.
[6]Avdeeva, I.L., 2017, Digitalization in ensuring inclusive economic growth. Industrial policy in the digital economy- problems and prospects: Proceedings of a Scientific and Practical Conference with International Participation/ ed. Dr. Econ. Sciences, Prof. A.V. Babkin. - SPb.: Polytechnical University, pp.16-22.
[7]Biryukova, M.E, Ovchinnikova, A.Yu., 2017, Trends and factors of inclusive development in the global world.Future of Science-2017 Collection of scientific articles of the 5th International Youth Scientific Conference, Vol 4: 75-79.
[8]Derunova, E., Andryushenko, S., Gerchikova, E., Firsova, A., Derunov, V., 2018, Monitoring of innovative activities effectiveness in agriculture. Scientific Papers. Series "Management, Economic Engineering in Agriculture and rural development", Vol. 18(3): 89-100.
[9]Derunova, E., Kireeva, N., Pruschak, O., 2019, Assessment and relationships between physical and economic accessibility of food: status and forecast. Scientific Papers Series «Management, Economic Engineering in Agriculture and Rural Development», Vol. 19 (1): 147-160.
[10]Derunova, E.A., Kireeva, N. A., Prushchak, O. V., 2019, Inclusive development of the agri-food system as a driver for sustainable growth in the region's economy. Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.19 (3):165-174.
[11]Derunova, E., Kireeva, N., Pruschak, O., 2019, Typology of regions according to the level of food security: methodological approaches and solutions. Scientific Papers Series «Management, Economic Engineering in Agriculture and Rural Development», Vol. 19 (1): 135-146.
[12]Derunova, E.A., Ustinova, N.V., Derunov, V.A., Semenov, A.S., 2016, Modeling of diversification of market as a basis for sustainable economic growth. Economic and Social Changes: Facts, Trends, Forecast, No. 6, pp. 91-109.
[13]Dumont, A.M., Baret, P.V., Vanloqueren, G., Stassart, P.M., 2016, Clarifying the socioeconomic dimensions of agroecology: between principles and practices. Agroecology and Sustainable Food Systems. 40(1):24-47.
[14]FAO's COVID-19 Response and Recovery Program http://www.fao.org/partnerships/resource-partners/covid-19/ru/, Accessed on August, 7, 2020.
[15]FAO's strategic work on rural poverty alleviation, http://www.uni-sz.bg/wp-ontent/uploads/biblioteka/file/TUNI10015715.pdf, Accessed on July 27, 2020.
[16]Gliessman, S., 2016, A milestone for food system sustainability. Agroecology and Sustainable Food Systems. 40(10):1041-1042.
[17]Global risks, 2015, http://www3.weforum.org/docs/WEF_Global_Risks_2015_Report15.pdf, Accessed on August 8, 2020.
[18]Goals for sustainable development 2030 - electronic resource - access mode: http://kg.one.un.org/content/unct/kyrgyzstan/ru/home/SDG/ Accessed on July 28, 2020.
[19]Hsu, J.W., 2019, Digital technology a must for inclusive growth: report. https://www.alizila.com/digital-technology-must-for-inclusive-growth-luohan/, Accessed on August 10, 2020.
[20]Hvitsand, C., 2016, Community supported agriculture (CSA) as a transformational act—distinct values and multiple motivations among farmers and consumers. Agroecology and Sustainable Food Systems. 40(4): 333-351.
[21]Ibrahim, D. R., Kazeem, O.I., Abdulfatai, A. A., 2018, Inclusive growth, human capital development and natural resource rent in SSA. Econ Change Restruct. 51: 29–48.
[22]Kireeva, N.A., Prushchak, O.V., 2019, An inclusive model of the development of the agri-food system of Russia: theoretical and methodological basis // Vestnik SGSEU. 2019 No. 5 (79), pp. 45-50.
[23]Kireeva, N.A., Prushchak, O.V., 2019, Food security of the region: assessment methodology, trends, forecast. Regional agrosystems: economics and sociology. 2019. No. 1. p.1.

[24]Kireeva, N.A., Prushchak, O.V., Sukhorukova, A.M., 2018, Agri-food system of the region: evolution, problems, development prospects. Saratov, p.216.
[25]Nurlanova, N., Brimbetova, N., 2017, Inclusive development in a spatial perspective: features, problems and opportunities of Kazakhstan. Societies and Economics. No. 9. pp.67-83.
[26]Popescu, A., 2018, Main aspects regarding the contribution of domestic trade to the development of Romania's economy in the period 2008-2017, Scientific Papers Series Management, Economic Engineering in culture and Rural Development Vol. 18(4): 250-259.
[27]Popescu, A., Dinu T., Stoian E., 2019, Changes, trends and relationships between average income and consumption expenditures per household in Romania in the period 2007-2017, Scientific Papers Series Management, Economic Engineering in culture and Rural Development Vol. 19(2): 364-375.
[28]State report "On the state and protection of the environment in the Russian Federation in 2018", http://www.mnr.gov.ru/docs/ o_sostoyanii_i_ob_okhrane_okruzhayushchey_sredy_rossiyskoy_federatsii / gosudarstvennyy_doklad_o_sostoyanii_i_ob_ob_okhrane_okruzhayushchey_sredy_rossiyskoy_federatsii / gosudarstvennyy_doklad_o_sostoyanii_i_ob_obrane_doklad_o_sostoyanii_i_ob_obrane_, Accessed on August 10, 2020.
[29]The UN Sustainable Development Goals and Russia. Human Development Report in the Russian Federation Analytical Center for Government of the Russian Federation, 2016, http://ac.gov.ru/, Accessed on August 12, 2020.
[30]Towards a green economy. Pathways to Sustainable Development and Poverty Eradication: A Synthesis Report for Officials / http://old.ecocongress.info/5_congr/docs/doklad.pdf, Accessed on August 10, 2020.
[31]Wezel, A., Casagrande, M., Brives, H., Dufour, A., Vandenbroucke, P., 2016, Agroecology territories: places for sustainable agricultural and food systems and biodiversity conservation. Agroecology and Sustainable Food Systems. 40(2):132-144.