

**Czech University of Life Sciences Prague**

**Faculty of Economics and Management**

**Department of Statistics**



**Diploma Thesis**

**Analysis of the development potential of organic  
production in Russia**

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# CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

## DIPLOMA THESIS ASSIGNMENT

Bc. Kristina Razmyslova, BS

Economics and Management

Economics and Management

Thesis title

**Analysis of the development potential of organical production in Russia**

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### Objectives of thesis

The general aim of the diploma thesis is to examine the development of organical production in Russia and evaluate the potential for using organical farming, based on analysis of key indicators of the organical agricultural.

### Methodology

The methodological base is a set of methods of economical and statistical research – comparative analysis of key indicators determining the level of development of the organical sector in Russia and the world. Analysis of the specialization of organical production using relative indicators of the structure. Time series analysis should be the base tool of research evaluating, and also tools of relative comparative indicators.

**The proposed extent of the thesis**

50 -70 pages

**Keywords**

time series, relative indicators, economical research, organical production,

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### **Declaration**

I declare that I have worked on my diploma thesis titled "Analysis of the development potential of organic production in Russia" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 31.03.2021

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# **Analysis of the development potential of organic production in Russia**

## **Abstract**

The content of this thesis is the statistical analysis of data relating to developing organic production in Russia and estimation its prospects. In the theoretical part of the work was considered the basic concepts and definitions used in the organic, the system of organization of state regulation of the market for organic products in foreign countries was considered, the main measures of state support for participants in the organic products market, problems were identified that hinder its rapid development of the Russian organic sector. In the practical part, first of all, there was analyzed the world experience in the development of organic production, and after that there was analyzed the current state and development of organic production in Russia. The main focus of the time series analysis was on such key indicators as the development of organic farmland, organic producers and the market for organic products in the period 2000-2019 for the world and 2004-2019 in case of Russia. Besides that, for estimation the prospects of the development of the organic sector in Russia and the world, forecast was made until 2025. In the last part, recommendations for further development were proposed based on the problems identified during the analysis.

**Keywords:** time series, organic sector, organic production, organic producers, organic farmland

# **Analýza rozvojového potenciálu ekologické produkce v Rusku**

## **Abstrakt**

Obsahem této práce je statistická analýza dat vztahujících se k rozvoji organické produkce v Rusku a odhad jejích vyhlídek. V teoretické části práce byly považovány základní pojmy a definice používané v ekologickém zemědělství, systém organizace státní regulace trhu s ekologickými produkty v zahraničí, hlavní opatření státní podpory pro účastníky ekologických produktů byly identifikovány problémy, které brání jeho rychlému rozvoji ruského ekologického sektoru. V praktické části byly nejprve analyzovány světové zkušenosti s vývojem ekologické produkce a poté byla analyzována současná situace a vývoj ekologické produkce v Rusku. Analýza časových řad se zaměřila především na takové klíčové ukazatele, jako je rozvoj ekologické zemědělské půdy, ekologičtí producenti a trh s ekologickými produkty v období 2000–2019 pro svět a 2004–2019 v případě Ruska. Kromě toho byla pro odhad vyhlídek na rozvoj organického sektoru v Rusku a ve světě vypracována prognóza do roku 2025. V poslední části byla na základě problémů identifikovaných během analýzy navržena doporučení pro další vývoj.

**Klíčová slova:** časové řady, relativní ukazatele, ekonomický výzkum, ekologická produkce, ekologičtí producenti, ekologická zemědělská půda

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## List of abbreviations

CIS	Commonwealth of Independent States
EU	European Union
FiBL	Research Institute of Organic Agriculture (Switzerland)
FL	Federal Law
GMO	Genetically Modified Organisms
GOST	Governmental standard
IFOAM	International Federation of Organic Agriculture Movements
JAS	Japanese Agricultural Standard
Mln	million
NOP	National Organic Program (USA)
NOU	National Organically Union of Russia
ROSKACHESTVO	Russian Quality System
UK	United Kingdom
USA	The United States of America
USDA	United States Department of Agriculture
WTO	World Trade Organization

# 1 Introduction

In the modern world, an increasing number of people are striving to lead a healthy lifestyle and eat environmentally friendly, organic products. There is a steady trend to increase the consumption of organic products, which is becoming more and more popular among many segments of the population. In this regard, the world market for organic products has emerged and is actively developing.

Scientists argue that eating organic and natural foods can prevent many common diseases, from eating disorders to cancer. According to the World Health Organization, every year almost every tenth inhabitant of the planet (about 600 million people) falls ill due to malnutrition.

Organic products are the guarantor of safety and health benefits for the population. According to international requirements, only in the production of organic agricultural products the entire life cycle of the product from the field to the point of sale is controlled, it is forbidden to use anything that can harm human health - chemical fertilizers and plant protection products, GMOs, antibiotics, growth hormones, food additives.

The development of the market for organic products has a positive impact on the formation of the country's food security, which is determined not only by the physical and economic availability of organic food products, but also by their quality, contributes to the sustainable development of rural areas (creation of new jobs, preservation of local cultural and historical traditions), contributes contribution to environmental policy and activates foreign trade (export and import of new goods and services).

Today, organic products occupy only about 1 - 2% of the world food turnover, but this area is rapidly developing, and interest in it is constantly growing. The number of people consuming organic products over the past 15 years has grown more than 5 times, and amounted to about 700 million people. Buyers are not confused by the higher cost of organic products, since during their production there is a ban on the use of additives that can have a negative impact on human health and safety and on the environment in general.

The share of Russia in the world organic market is only 0.17%. But at the same time, it should be noted that Russia has everything necessary for the formation of agriculture focused on the production of organic products: long-term agricultural traditions, vast areas of agricultural land, as well as an insignificant level of intensification and chemicalization of the agricultural complex in comparison with industrially developed countries. In this

regard, the development of theoretical issues related to the prospects for the development of organic agriculture in Russia becomes relevant and timely.

According to the government of the Russian Federation, the production of organic products is currently one of the promising areas for the development of agriculture, but at the same time, this market in Russia is organized largely spontaneously and is developing at an insufficiently high rate.

One of the effective tools for promoting the development of the market for organic products is its scientific and information support.

## 2 Objectives and Methodology

### 2.1 Objectives

The general aim of the diploma thesis is to examine the development of organical production in Russia and evaluate the potential for using organical farming, based on analysis of key indicators of the organical agricultural.

Research questions of the Diploma Thesis include:

- What are the historical aspects of the emergence and development of organic agriculture?
- What are the main concepts and definitions applied in this field?
- What are the main components of the state regulation system and measures of state support for the organic segment in foreign countries?
- What is the state regulation of the Russian organic agricultural products market?
- What is the current state and main trends of the global organic production?
- What are the current state and how change the key indicators of the organic sector in Russia?
- What are the prospects for the development of organic agriculture in Russia?
- What factors are holding back the growth of the organic sector in Russia?
- What needs to be developed to realize the potential of Russian organic production?

### 2.2 Methodology

***Time period:*** I will cover the period of 20 years from 2000 to 2019 for world data and 16 years from 2004 to 2019 in the case of Russia. I would like to note that the reason choosing the time period from 2004 because the organic sector in Russia is on the stage of the formation and there is no available data for earlier years. And this is basic limitation of the research.

***Limitation of research:*** Statistical sources containing indicators characterizing the state and dynamics of development of the market for organic products in Russia differ from the leading developed countries, since the official national statistics do not reflect them. There is no registration of these indicators in the Ministry of Agriculture, as well in the agricultural census.

The most reliable data on the state of organic agriculture comes from a small number of certifying organizations (mostly foreign) operating in Russia. The results of these assessments are published in yearbooks published by FiBL and IFOAM.

**Data for analysis:** the National Organic Union of Russia, The Research Institute of Organic Agriculture (FiBL) and International Federation of Organic Agriculture Movements (IFOAM - Organics International), The World Bank.

**Main methodological tools:** The base tool of research is time series analysis to estimate development of the key indicators of the organic sector. The main focus of the time series analysis was on such key indicators as the development of organic farmland, organic producers and the market for organic products. In particular, for these indicators, the absolute growth, growth rate, average values of the time series, moving five-year average were calculated and parallel time series were compared. For estimation of the prospects of the development of the organic sector in Russia, using the method of analytical smoothing, the main trend in the development of key indicators was identified and their forecast was calculated until 2025. Other standard statistical methods were also used in the analysis. Further methodological tools will be described in a little more detail.

### **Calculation of dynamic indicators**

To characterize the direction and intensity of changes in the mass phenomenon in time, the levels of the time series are compared and a system of derived indicators is obtained: absolute growth, growth rate, growth rate in percent.

*The absolute growth A* is the difference between two initial levels, one of which is considered as a estimated value, and the other is taken as a comparison base. There are the following types of absolute increments:

- a) chain in this case, the previous level is taken as the comparison base every time;

$$A_1 = y_1 - y_0; A_2 = y_2 - y_1; \dots; A_n = y_n - y_{n-1} \quad (1)$$

- b) basic for comparison, the same initial level  $y_0$  is taken all the time.

$$A_1 = y_1 - y_0; A_2 = y_2 - y_0; \dots; A_n = y_n - y_0 \quad (2)$$

where  $y_0, y_1, y_2, \dots, y_n$  are the levels of the time series (Zinchenko, 2007);

*The growth coefficient K* expresses the ratio of the two levels of value for the estimated year and value for the base year. The chain coefficients are calculated by the formula (3), and the basic ones are calculated by the formula (4).

$$K_i = \frac{y_i}{y_{i-1}} \quad (3)$$

$$K_i = \frac{y_i}{y_0} \quad (4)$$

The product of chain coefficients is equal to the basic coefficient of the extreme levels of the original series:

$$K_1 K_2 \dots K_n = \frac{y_1}{y_0} \cdot \frac{y_2}{y_1} \dots \frac{y_n}{y_{n-1}} = \frac{y_n}{y_0} \quad (5)$$

The growth rate in %  $T$  is the ratio of the chain absolute growth  $A_i$  to the previous level  $y_{i-1}$ , expressed as a percentage:

$$T_1 = (A_1/y_0) \cdot 100; T_2 = (A_2/y_1) \cdot 100; \dots; T_n = (A_n/y_{n-1}) \cdot 100 \quad (6)$$

where  $y_0, y_1, y_2, \dots, y_n$  are the levels of the time series and  $A_1, A_2, \dots, A_n$  – absolute growth (Zinchenko, 2007).

To obtain their generalized level for the entire study period, average levels are calculated, thereby abstracting from random fluctuations.

The average value of the time series with equal intervals is determined as the arithmetic mean:

$$\bar{y} = \sum y_i / n \quad (7)$$

where  $n$  is the total number of levels in the series (including the base level  $y_0$ ) and  $\sum y_i$  is the sum of all values in time series (Zinchenko, 2007).

The average absolute growth  $\bar{A}$  for interval and moment series with equal time intervals is determined:

$$\bar{A} = \frac{\sum A_i}{n} = \frac{y_n - y_0}{n} \quad (8)$$

The average growth rate  $\bar{K}$  is the geometric mean of the chain growth rates  $K_i$ :

$$\bar{K} = \sqrt[n]{\frac{y_n}{y_0}} \quad (9)$$

The average growth rate in %  $\bar{T}$  is determined by:

$$\bar{T} = (\bar{K} - 1) \cdot 100\% \quad (10)$$

where  $n$  is the total number of levels in the series,  $y_0, y_n$  are the first and the last levels of the time series (Zinchenko, 2007).

### ***Smoothing of time series with moving means***

Estimating the development trend, the individual values of the time series are replaced by levels free from random fluctuations and reflecting a systematic change in the phenomenon over time. Abstraction from random variation in statistics is most often achieved by calculating averages. Moving averages are determined for periods of the same

duration, successively shifting them by one date. So, when calculating for a five-year period, the first average is determined for the 1-5th dates, the second for the 2-6th, the third for the 3-7th, and so on. To calculate the 5-year moving average. First, the amounts are determined for moving five-years: for years 1-5, for years 2-6, etc. Further, the resulting sums are divided by the number of years  $n = 5$  and the moving averages are determined using a simple arithmetic formula:

$$\bar{y} = \sum y_i / n \quad (11)$$

where  $n$  is the total number of levels in the time series) and  $\sum y_i$  is the sum of for moving five-years (Zinchenko, 2007).

### ***Defining a trend in Excel***

It can be used Excel tools to determine which trend for describing the development of data. It is necessary to add a trend line to the chart. To do this, you need to select the initial values of the chart, call the context menu by clicking the right mouse button, and select the item "Add trend line", then select the type of trend (linear, exponential, logarithmic, polynomial of the second degree and higher, and so on) and on the tab "Parameters" add the output of the equation and the coefficient of approximation (determination)  $R^2$ .

To select the best approximating (representing real levels) function,  $R^2$  or residual variance (unbiased variance estimate) is used:

$$S_e^2 = \frac{\sum_{t=1}^n (\tilde{y}_t - y_t)^2}{n - p - 1} \quad (12)$$

An unbiased variance estimate can be found through its biased estimate:

$$\sigma_e^2 = \sigma_y^2 (1 - R^2) \quad (13)$$

$$S_e^2 = \sigma_e^2 \frac{n}{n - p - 1} \quad (14)$$

where  $n$  is the total number,  $p$  is the number of trend parameters without an intercept,  $R^2$  determination coefficient  $\sigma_e^2$  biased variance estimate,  $S_e^2$  residual variance (unbiased variance estimate) residual variance (unbiased variance estimate) (Ukolova, 2008).

The larger the value of the coefficient of determination and the smaller the residual variance, the better the function displays the initial levels of the series. And the forecast is calculated using the selected function and the average forecast error using the formula (15).



$$m_{y_n} = \sqrt{S_e^2 \left(1 + \frac{1}{n} + \frac{(t_n - \bar{t})^2}{n\sigma_t^2}\right)} \quad (52)$$

Where  $S_e^2$  residual variance,  $n$  is the total number,  $\sigma_t^2$  variance of time period,  $t_n$  - forecasting period,  $\bar{t}$  - mean value of time period (Ukolova, 2008).

### ***Estimation of structural changes***

To assess the structural differences, the following indicators can be used: the Herfindahl - Hirschman index, the Gatev integral coefficient, the Salai index of structural changes, the Ryabtsev index, and others. The most preferable from the point of view of economic interpretation is the Ryabtsev index, which has a scale of values and does not overestimate structural changes, like the Salai index. The advantage of the integral coefficient of structural differences Ryabtsev is also the fact that it does not depend on the number of gradations in the structure of the population. The Ryabtsev index is defined as the ratio of the actual measure of discrepancies between the values of the components of two structures with their maximum possible value:

$$R_j = \sqrt{\frac{\sum(d_{2i}-d_{1i})^2}{\sum(d_{2i}+d_{1i})^2}} \quad (13)$$

where  $R_j$  is the integral coefficient of Ryabtsev's structural differences.  $d_{1i}$   $d_{2i}$  – shares (weights) of the  $i$ -th element (group) of the first in and the second set of data (Eliseeva, 2010).

To interpret the results, the scale for assessing the measure of the significance of differences in structures proposed by V.M. Ryabtsev (Table 1).

Table 1 Scale for assessing the degree of materiality of differences in structures by Ryabtsev index

Intervals of the index value	Characterization of the measure of structural differences
0.000 – 0.030	Identity of structures
0.031 – 0.070	Very low level of structural differences
0.071 – 0.150	Low level of structural differences
0.151 – 0.300	Average level of structural differences
0.301 – 0.500	Significant level of structural differences
0.501 – 0.700	Very significant level of structural differences
0.701 – 0.900	Opposite type of structures
0.901 and higher	The complete opposite of structures

Source: (Kovalev, 2020)

## 3 Literature Review

### 3.1 Historical aspects of the emergence and development of organic agriculture

Interest in healthy lifestyles and organic products, which is popular in the U.S.A. and Western Europe, is spreading with great speed all over the world.

The benefits of organic products are widely promoted, both for the health of an individual and for the environment as a whole, thereby attracting more and more consumers, and, consequently, producers of useful and natural products.

The concept of organic agriculture began gaining popularity only closer to the middle of the twentieth century, when it became interesting and began being studied in Europe and the United States. There are several versions about who became the founder of this direction, but the main one says that the very concept of organic agriculture was first proposed for use by an expert in agriculture at the University of Oxford, Lord Northbourne, in his book “Look to the Land” published in 1940 (Svechnikova, 2019, p. 458).

Another version refers to a book by Walter James in the 1940s, which introduced the idea of organic agriculture and its advantages over chemical farming.

Researchers of this issue believe that in the first half of the twentieth century there were four main centers from which the modern organic movement emerged. They can be divided roughly into:

- Japanese (M. Okada, M. Fukuoka);
- German (R. Steiner, H.-P. Rusch, N. Müller, H. Müller);
- British (A. Howard, E. Balfour, R. Macarison, and D. Northbourne);
- American (F.H. King, D.I. Rodale).

So, the prerequisites for the introduction of organic agriculture arose in the early twentieth century in Japan, where the Japanese farmer Masanobu Fukuoka grew his crop without the use of chemicals, pesticides and other effects on the natural growth process. Subsequently, he published the books “The Natural Way of Farming: The Theory and Practice of Green Philosophy” and “The One-Straw Revolution” (Gusakov, 2012, p. 17).

Albert Howard published his book “An agriculture testament” in 1940. It had a strong impact on the farmers living at the time. In this book he described the negative effects that chemical additives had on crops, soil, and animals (Gusakov, 2012, p. 15).

Under the influence of Albert Hovarad's writings in The UK, Eva Balfour conducted the world's first scientific experiment comparing the benefits and harms of conventional and organic agriculture, confirming the advantages of the second.

Various farmers' associations such as BioLand, SoilAssociation, and BioSuisse implemented the standards themselves, which then served as the basis for the regulatory framework that began forming in the field of organic agriculture.

And yet the most popular opinion is that the person who introduced and popularized organic farming was a US citizen, Jerome Irving Rodale. In 1942, he became the founder of the magazine “Organic Farming and Gardening”, and in 1950, he presented to the world another work called “Prevention”, in which the idea of organic agriculture was presented in a philosophical form (Lyubovedskaya, 2020)

Robert Rodale, who continued his father's business, slightly changed the concept and focused not only on the health benefits, but also on the environmental benefits of organic products. Later, in 1971 Robert Rodale founded the Rodale Research Center. In our time, it is called the “The Rodale Institute”.

During this period, organic farms were created by enthusiasts and weren't commercial in nature.

In the 60s of the twentieth century, producers and consumers realized that the amount of chemicals used in agriculture and animal husbandry could harm human health and the environment, and in 1972 the International Federation of Organic Agriculture Movements (IFOAM) was established. The purpose of the federation was to spread information and introduce organic agriculture in all countries of the world. Currently, it is an international non-governmental organization that defends the interests of all organizations involved in organic agriculture.

The first rules for organic farming were the “Basic Standards” adapted by the International Federation of the Organic Agriculture Movement (IFOAM) in 1983. In this set of rules, a list of requirements for organic farming has been defined in a generalized form.

The three main IFOAM documents:

- Common Goals and Requirements of Organic Standards (COROS) - Common IFOAM Requirements;
- IFOAM standard for Organic production and Processing systems;
- Accreditation requirements for certification agencies that control organic production and processing processes.

The goal of the IFOAM Organic Production Guarantee system is to promote the worldwide adoption of a socially sustainable, cost-effective, environmentally friendly system based on organic farming principles. (Chukhlantsev, 2019).

The IFOAM organic production guarantee system promotes international trade, maintains the purity of organic production and inspires the confidence of buyers around the world.

The IFOAM Guarantee System is based on a Collection of IFOAM Standards. It includes all the standards and technical regulations adopted by IFOAM as common goals and requirements of Organic Standards (COROS) - Common Requirements of IFOAM.

In this way, the Collection of IFOAM Standards is a way to distinguish between organic and inorganic standards. All standards and regulations reflected in the IFOAM Standards Collection are recognized by IFOAM as the only valid organic standards and can be used for certification in the guarantee system.

IFOAM's regulatory requirements are the basis for the international organic production guarantee system.

The concept of organic farming is based on four basic principles, which are declared by the International Federation of the Movement. In addition, these principles form the basis of European legal standards governing the organic market.

The principle of health. Any activity in the field of agriculture should be aimed at maintaining and improving the health of both people and the entire ecological system, including plants, animals and soil. This principle is based on the belief that human health is inseparable from the health of the ecosystem. Healthy soil gives life to healthy plants and becomes food for healthy animals and people (Lazko, 2019, p. 113).

The principle of ecology. The production of food and non-food agricultural products must be carried out within the natural ecological system and natural life cycles. Any activity in this direction must necessarily take into account the specific conditions and characteristics of the specific area where the farm is located. Agriculture does not have to radically transform the landscape, climate and the environment in general (Lazko, 2019, p. 113).

The principle of justice. Agriculture must ensure a decent standard of living and food security for all countries and overcome poverty. Everyone should have access to quality products. The allocation of natural resources should be based on the interests of future generations (Lazko, 2019, p. 113).

The principle of Care. Improving the efficiency and productivity of agricultural production shouldn't be at the expense of the health and well-being of both people and nature. Organic production should avoid unnecessary risk and widespread use of technologies whose delayed effects cannot be fully calculated. This means not only that organic fertilizers in agriculture should replace chemistry, but that the use of the results of genetic engineering is also unacceptable. (Novitsky, 2017).

The concept of organic agriculture, which consists in the rejection of components that harm both humans and their environment, including the state of the soil and water, has reached our time, revealing even more advantages. Organic agriculture still strives to follow biological and ecological natural cycles and improve the ecosystem in general. Its goal is to achieve a favorable interaction between humans and the rest of the existing life forms.

According to the Research Institute of Organic Agriculture (FIBL), 181 countries of the world out of 230, including Russia, are currently involved in the production of organic agricultural products. 93 countries have their own laws in the field of production and turnover of organic products.

The concept of organic agriculture is gaining more and more confidence from consumers every day and motivates them to buy naturally grown products that are as clean as possible from any chemical influences.

### **3.2 Basic concepts and definitions of the organic sector**

Historically, organic agriculture has always been environmentally oriented in its content, has served to preserve the health of people and has been based on the use of resources of organic origin. Based on these traditions, such concepts as “ecological agriculture”, “environmentally friendly products”, “organic products”, “bio-products” have come into use.

In Western European countries, the terms “ecological” and “biological” are used to refer to organic agriculture (Germany, Spain). In French and Italian, the adjective “biological” is also used. In Western literature, the concepts of “organic”, “biological” and “ecological” are used as equivalent. But in practice, such a replacement is permissible only if the production of ecological products or bio-products fully meets the requirements of the production of organic products.

Thus, the terms “eco”, “bio” and “organic” refer to environmentally friendly products produced in compliance with the principles of organic agriculture. According to European and American standards, the label “organic” (“bio” or “eco”) indicates that at least 95% of the product composition is organic. If the label “made with organic” or “less than 70% of product composition is organic” is used on the packaging it means that at least 70% of the product in the first case or less than 70% of product in the second case is organic. In this instance, the word “organic” can’t be used on the front side of the package, but the producer can specify a list of organic components that are part of the product.

The concept of “organic market” has been used internationally for more than a decade, as many foreign countries are actively developing the production, processing, storage, transportation, wholesale and retail sale of organic products.

In Russia, researchers from the Federal Research Center of Agrarian Economy and Social Development of Rural Areas - Russian Research Institute of Agricultural Economics Dolgushkin N.K. and Poptsova A.G., engaged in research activities in the field of organic agriculture, offers the following definition of the market for organic products. The organic products market is a segment of the agri-food market that is weakly dependent on material resources of industrial origin, with partially allocated channels of commodity movement, expressed in the system of economic relations between the production, processing and sale (distribution) of organic products and in the relations between the relevant economic entities and end consumers on the basis of intellectual and informational mutually beneficial interaction, increasingly based on the use of information and communication technologies (Dolgushkin, 2018, p. 28).

In the legislation of the Russian Federation, the concepts of “Organic products” and “Organic agriculture” are fixed. Other concepts have acquired a different meaning: “eco” means that the product is produced with minimal impact on the environment, “bio” refers to dairy products containing live bacteria (for example, bio-kefir, bio-yogurt).

In the last few decades, many definitions of organic agriculture have been formulated in various countries all over the world. They were based on numerous studies of scientists in the field of organic agriculture, the experience of organic farms, taking into account the specifics of their methods, as well as the principles of organic agriculture formulated by IFOAM.

Most of the definitions of organic agriculture are based on the principles of health and ecology. The most popular definition is of the International Federation of Organic Agriculture Movements (Table 2).

Table 2 Definitions of organic agriculture

Source / Organization	Definition
IFOAM (2008)	Organic Agriculture is a production system that sustains the health of soils, ecosystems, and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation, and science to benefit the shared environment and promote fair relationships and good quality of life for all involved.
Directorate General of the European Commission for Agriculture and Rural Development	Organic farming is an agricultural system that strives to provide the consumer with fresh, delicious, authentic food, while maintaining the life cycles of natural ecological systems.
National Standard of the Russian Federation (GOST R 56104-2014)	Organic agriculture: A production system that improves the ecosystem, preserves soil fertility, protects human health, and, taking into account local conditions and relying on ecological cycles, preserves biological diversity, does not use components that can harm the environment. Note: organic land use combines traditional farming practices, innovative technologies and modern scientific and technological developments that benefit the environment and, by ensuring a close relationship between all life forms included in this system, support and ensure their beneficial development.

Source: (Dolgushkin, 2018, p. 25)

There are numerous definitions of “organic food” or “organic products”, as well as of “organic agriculture”

Table 3 shows several relevant definitions, including those officially adopted in Russia. The most commonly used term is “organic food product”, since it is such products that dominate the global organic market (Dolgushkin, 2018, p. 29).

The definitions of organic products from IFOAM and the American Dictionary of Agriculture are simple and tied to the requirements of organic standards.

Table 3 Definitions of organic food products

Source	Definition
IFOAM (2008)	An organic product is a product that has been produced, treated or processed in accordance with the requirements of an organic standard.
National Standard of the Russian Federation (GOST R 56508-2015) (Russia 2015)	Organic products: products of plant, animal, microbial origin, as well as aquaculture in natural treated or processed form, consumed by humans for food, used as animal feed, planting and sowing material, obtained as a result of production, certified for compliance with the requirements of this standard.
National Standard of the Russian Federation (GOST R 56104-2014) (Russia 2014)	Organic food product is a product in natural or processed form, produced from raw plant-based and animal-based materials, grown in areas for organic agricultural production, as well as forest, bee and fish products, grown, produced, processed, certified, labelled, stored and sold in accordance with the rules of organic production, intended for consumption in food in processed or non - processed form

Source: (Dolgushkin, 2018, p. 29)

In the Russian Federation, there is a Federal Law of 03.08.2018 N 280-FL (The Federal Law) “On organic products and on Amendments to certain legislative acts of the Russian Federation”, entered into force on 01.01.2020. It introduces the following concepts:

- Organic agriculture is a set of economic activities that are defined by Federal Law N 264-FL of 29.12.2006 "On the Development of Agriculture" and in the implementation of methods and technologies which are used to ensure a favorable state of the environment, promote human health, preserve and restore soil fertility.

- Organic products are environmentally friendly agricultural products, raw materials and food. Its production meets the requirements established by the Federal Law.

- Organic producers are legal entities and individuals who produce, store, label, transport, and sell organic products. They are included in the unified state register of organic producers.

In addition, in accordance with GOST33980-2016 organic products can be divided into:

- “processed organic product” - at least 95% organic raw materials;



- product that is produced “using organic ingredients” - at least 70% organic raw materials;
- only certain ingredients specified in the list of product components may be labeled as "organic" - less than 70% organic raw materials.

Distinguishing and clarifying the concepts used for scientific research of organic agriculture, organic market is a fundamentally important issue that requires a clear approach, since the confusion and substitution of concepts can ultimately lead to misinformation as consumers, and government agencies that provide financial support to this direction.

### **3.3 The system of state regulation of the organic sector in foreign countries**

The USA, Canada, Europe, India, Japan and China have the most developed systems of organic farming regulation. Countries of the Commonwealth of Independent States such as Belarus, Moldova, Georgia, Kazakhstan, Ukraine and Armenia have also passed laws on organic farming. (Korshunov, 2019, p. 10).

The experience of the development of the world market shows that in the countries that have achieved the most significant success in the production and consumption of organic products, state regulation of this sector plays a significant role.

The importance and necessity of the active participation of the state in the regulation of the market of organic products is determined by the specifics of its organization.

- The presence of a transition period when the yield of organic agricultural land and the productivity of farm animals can significantly decrease in comparison with traditional agriculture. Therefore, in order to maintain the competitiveness of organic farms, financial support from the state is required and it can be quite difficult to do without it

- The need for quality assurance through certification and inspection. At all stages of the movement of organic products from the producer to the final consumer, it is necessary to ensure compliance with organic standards. In addition, certification services can be quite expensive and the state can compensate farmers for some of the necessary costs.

- The need for information and consulting services. This includes consulting, training, and the development of research activities in the field of organic agriculture and the organic market. Here, the state can play an organizational or financial and economic role.

- Stimulating demand. Organic food products are in most cases more expensive than conventional agricultural products. For this reason, this segment of the market is losing a

significant number of customers. The state can support low-income consumers by providing various benefits, for example, for baby food, school breakfasts, etc.

The form of expression of state regulation of the organic market is primarily normative legal acts. Regulation is carried out with their help.

Currently, the existing system of state regulation of the organic market in developed countries can be divided into three main blocks: the organic guarantee system, intellectual and informational support of the organic market, and financial support in the organic market.

Based on the analysis of the literature on this issue, the following main blocks can be distinguished in the structure of the system of state regulation of the organic products market in developed countries:

1. An organic guarantee system is a system that guarantees the standards and quality of organic products at all stages of their movement from the manufacturer to the end consumer.

It includes: the creation of standards, regulations governing the production of organic products, certification of organic producers, inspection, accreditation of certifying organizations, labeling of organic products (Avarsky, 2018, p. 160).

Currently, in the developed countries of the West, there is an integral guarantee system for the quality of products produced in organic agriculture, which is ensured by a developed system of certification and inspection, covering the technology of organic production, factors of production and final organic products. Such an inspection in Europe is carried out by well-known inspection and / or organic certification organizations. These are, for example, Bioland (Germany), DemeterInternational (Germany and German-speaking countries), SKAL (Netherlands), SoilAssociation (UK), OrganicFarmersandGrowers (UK), KRAV (Sweden), Agencebio (France), etc.

2. Intellectual and informational support by the state for the development of the market for organic products. It includes direct and indirect forms of support from the state.

Direct forms include professional development, consulting services to organic producers of goods. Indirect support is activities related to the organization of specialized education for organic producers, providing them with information about its condition. Also, the state can help promote organic products to the market through advertising. (Avarsky, 2018, p.161).

3. Financial support for organic market operators. This area primarily includes various forms of state financing of agricultural producers. In particular, financing of certification,

information support for market operators, advertising of organic products. Direct financial support is provided to agricultural producers, mainly in the implementation of the transition stage to organic agriculture. (Avarsky, 2018, p.161).

The most significant financial support in the organic market is provided in the United States and in the European Union.

All of three blocks are vital for ensuring the normal functioning of the organic market. However, they can provide real assistance to the organic market in any country only if there are certain institutions that are responsible for the development and compliance with organic standards, the formation of policies in the field of research and education in the organic sector, as well as in the field of financial support for organic production. This may be an existing national institution or a newly created body that will be responsible for implementing the organic legislation (Avarsky, 2018, p. 161). The classic situation is when the main competent authority in the organic market is the state body responsible for the management of all agriculture. Normally it is the Ministry of Agriculture.

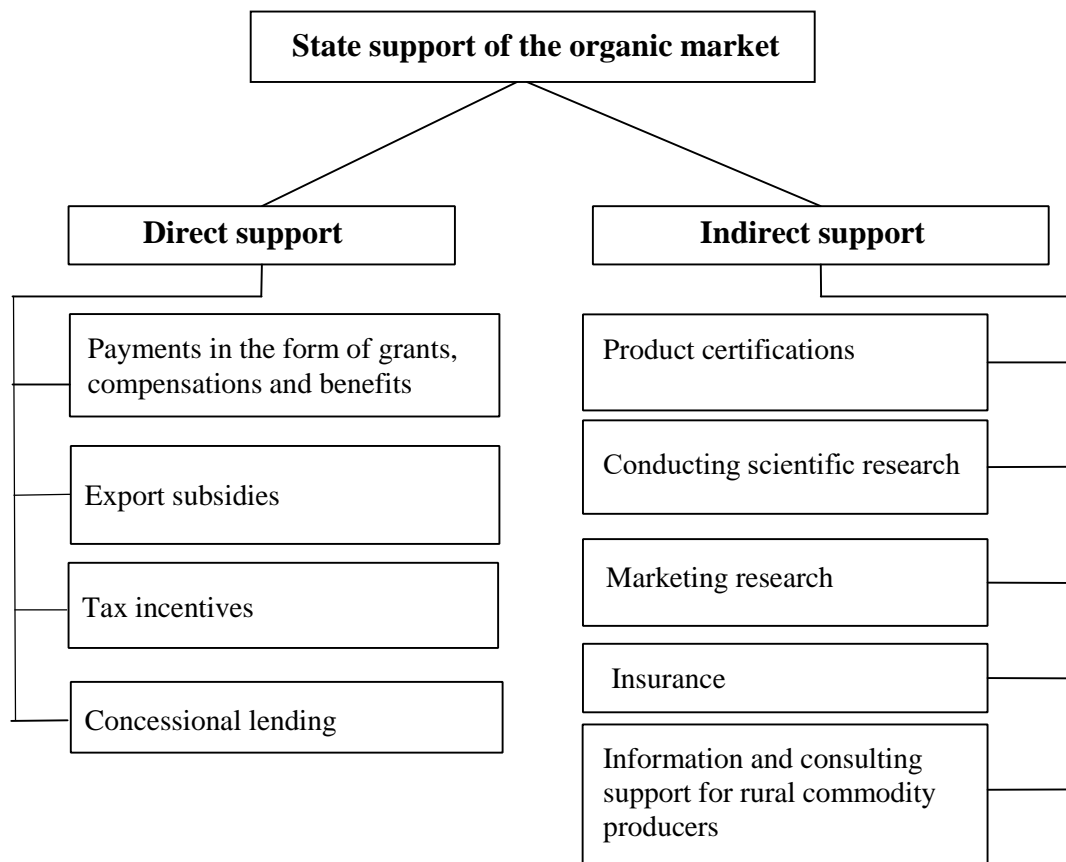
### **3.4 Measures of state support for organic products market participants**

State support for organic market participants is an important factor in the development of the organic market. It can be divided into 2 directions: direct and indirect. It can also be represented as a set of tools (Picture 1).

Direct support for organic production (mainly related to the transition and post-transition stage of organic agriculture).

Indirect support consists of compensating part of the costs of certification of organic production, promoting intellectual and information support for operators of the organic market, and promoting the development of this area through various sources (Korshunov, 2019, p. 11).

Picture 1 State support of the organic market



Source: Compiled by the author

Developed foreign countries have a well-functioning system of state support for the production and use of organic products.

The most significant financial support in the organic market is provided in the United States and the EU (Korshunov, 2019, p. 11).

### *State support in the United States*

In the United States, the amount of financial support is generally lower than in the European Union. The difference in the structure is that most of the costs fall on indirect support.

Budgetary expenditures include:

- research expenditures.;
- expenditure under the National Certification Cost Share Program on a co-financing basis;
- the costs of organic market information support

In the United States there are Federal regulations governing the organic market support that have appeared quite recently. For example, in the environmental section of the Law on Agriculture in 2008, provisions on financial assistance to organic producers were introduced for the first time. To implement these provisions in 2009, the Natural Resources Conservation Service (NRCS) The USDA initiated the so-called Organic Initiative as part of the Environmental Quality Incentive Program (EQIP). The maximum amount of financial assistance per year was set at \$ 20 thousand, and for a six-year period - \$ 80 thousand. These payments were calculated mainly for the transition period for carrying out environmental protection measures, as well as meeting the requirements of the US Organic Standards (NOP). The original payout levels are still in force (Korshunov, 2019, p. 12).

In the U.S. there is also support for organic market development at the level of individual states, including through co-financing with federal programs.

It includes:

- cost subsidies related to organic certification;
- support for farmers in transition and marketing of organic products;
- tax credit (for example, over a property tax).

### *State support in the EU countries*

The EU countries have a high level of support for organic producers. Subsidies are paid to them from funds that ensure the implementation of the fundamental elements (Pillars) of the Common Agricultural Policy (CAP) of the EU countries, as well as from regional and national sources.

According to the functional feature, financial support for the operators of the organic products market in the EU countries is carried out in three main directions

- as part of the framework of activities under Rural Development Programs;
- aiming to the direct support for the production and development of agri-food markets;
- as part of the framework of national and regional agricultural support programs (Korshunov, 2019, p. 12).

The most common form of organic market support is scientific research. They are implemented exclusively at the national level, and they are used in at least 19 EU countries (including the UK).

The least common form of support is investment in organic farming. At the national level only in Ireland.

A special item with differentiated sources of funding is the support of certification and inspection services, which uses national and regional budget funds. Specifically, such assistance is provided at the national level in Denmark, Ireland, Italy, Poland and Romania (Korshunov, 2019, p. 16).

In Germany (in most regions), there is a special program to assist in the provision of certification and inspection services in the organic market. In Denmark, organic certification is free for farmers (Korshunov, 2019, p. 17).

### ***State support in the post-Soviet countries***

In the countries of the former Soviet Union, government support for the organic production and trade sectors differs significantly. It is represented in Moldova to a greater extent. In this country, already in 2006, legislation was adopted to regulate the market for organic products. Farmers are provided here with direct financial support during the transition period. In the first year it is 56 dollars per hectare of land, 32 in the second and 24 in the third year.

There are state bodies in Moldova that regulate this sector of the economy. These include the Department of Organic Agriculture and Renewable Resources, which is established under the Ministry of Agriculture. Also in the district departments there are specialists in organic agriculture.

The state provided government procurement for the catering sector in the amount of about 200 tons of organic products. 600 tons of vegetables are sold on the domestic market of Moldova because of government subsidies.

Continuous training in organic agriculture is carried out at the State Agrarian University of Moldova. In addition, organic farming courses are regularly organized for farmers and advisory workers by the Ministry of Agriculture.

Agricultural research institutions have demonstration sites for showing organic technologies, and they organize special courses on the transfer of these technologies.

Organic producers also receive financial support through government support programs for other industries, such as the wine industry. In particular, out of 34 grape processing points, which received 80 million dollars of investment for modernization, 2 points produce organic wines. (Korshunov, 2019, p. 17).

The governments of many countries actively support eco-production, as it helps to strengthen the domestic market, increase exports, and help to solve economic and

environmental problems. Therefore, it is better to develop the system of state support for the organic market of the Russian Federation taking into account the accumulated advanced foreign experience.

### **3.5 State regulation of the organic products market in Russia**

Organic agriculture, as a special area of agricultural production, requires separate legislative regulation. This is due to a number of factors, including the risks of falsification of organic products and the lack of consumer awareness about organic agriculture.

The development of forms and methods of state regulation of the organic market creates conditions for the development of organic agriculture and farming in Russia. This will allow to provide environmentally friendly products not only to consumers in our country, but also provide an opportunity for domestic organizations to become full-fledged players in the international organic market.

Currently, the Russian organic market is regulated by three national standards that regulate the rules of production and turnover of organic products and certification of producers and the federal law "On Organic Products".

- GOST R 56104-2014 “Organic food products. Terms and definitions”.
- GOST R 57022-2016 “Products Of Organic Production. The procedure for conducting voluntary certification of organic production”.
- Interstate standard GOST 33980-2016 “Organic products, rules of production, processing, labeling and sale (CAC / GL 32-1999, NEQ)”. (the procedure for approving the standard with IFOAM international has begun).

The interstate standard GOST 33980-2016 is harmonized with international requirements by about 70% but is not equivalent to them.

According to the National Standardization Plan for 2020-21, it is planned to prepare and adopt two more standards:

- GOST R “Organic products from wild raw materials. Rules for harvesting, collecting, storing and processing”.
- GOST R “Products of organic production. Biological products for plant protection. General technical conditions”.

It is also planned to make changes to GOST 33980-2016 (based on the comments of IFOAM international) and GOST R 57022-2016.

On January 1, 2020, Federal Law No. 280-FZ "On Organic Products and on Amendments to Certain Legislative Acts of the Russian Federation" came into force in Russia. It introduces the concept of "organic products" and regulates their production, storage, transportation, labeling and sale. It contains a list of the main requirements for the production of biological products. At the same time, this law does not apply to perfumes and cosmetics, wild plants, medicinal herbs, fish products (in addition to aquaculture). The law also establishes the norms of state support for this industry.

Confirmation of compliance with organic products is carried out in the form of voluntary certification (Federal Law of 03.08.2018 N 280-FZ "On organic products and on amendments to certain legislative acts of the Russian Federation").

The right to certify producers of organic products is granted to certification agencies that have been accredited by the Federal Accreditation Service (RusAccreditation) according to the interstate standard GOST 33980-2016.

Picture 2 Certification organizations that have been accredited

As of 01.12.2020 Rusaccreditation accredited 7 certification agencies:

- "Organic expert", certificate of accreditation under the number RA. RU. 1ONVO1. (there are 34 certified companies in the register)
- Roskachestvo, extension of the scope of accreditation of Ra-339 from 18.12.2019 (there are 19 certified companies in the register)
- "Organic Certification", certificate of accreditation under the number RA.RU. 11HB76 (there are 9 certified companies in the register)
- OS of the branch of the Federal State Budgetary Institution "Rosselkhoz nadzor" in the Voronezh region, certificate of accreditation under the number RA. RU. 11HB48 dated 21.10.2019 (certified companies in the register — 0)
- "Test Tatarstan", extension of the scope of accreditation Ra-464 from 28.10.2020 (certified companies in the register-0)
- OS of the branch of the Federal State Budgetary Institution "Rosselkhoz nadzor" in the Krasnodar Territory, extension of the scope of accreditation of RA 467 from 27.10.2020 (certified companies in the register-0)
- Rostov branch of the Federal State Budgetary Institution "Center for Grain Quality Assessment", expansion of the scope of accreditation (certified companies in the register - 0)

Source: Union of Organic Farming in Russia, 2020

Their current list of certificated agencies is available on the website of the Union of Organic Agriculture.



In addition to Russian certifiers, there are 16 foreign certification companies operating on the territory of the Russian Federation that have an EU permit for inspections in Russia (National Organic Union in Russia, 2020).

In 2020, the unified state register of producers of organic products according to Russian standards was created and it is in force in Russia (Order of the Ministry of Agriculture of the Russian Federation No. 633 of 19.11.2019 “On Approval of the procedure for maintaining the unified State Register of Producers of Organic Products”). It is conducted by the Ministry of Agriculture of Russia. According to Law No. 280-FL, organic producers are recognized as individuals and legal entities that are included in the unified state register.

The basis for inclusion in the register is the certificate of compliance with GOST 339-80-2016, issued by an accredited certification agency. As of February 01, 2021, 60 organic producers were added to the register.

Everyone can get information from the unified state register of organic producers for free. Information that can be found from the unified state register:

- name of the manufacturing company,
- place of production,
- volumes and types of products produced,
- number and validity period of the certificate.

After the company is included in the state register of organic producers, it gets the right to label its products with a single state logo of organic products.

Russia has adopted a single state logo of organic products, which is in force now (Order of the Ministry of Agriculture of the Russian Federation No. 634 of 19.11.2019).

Picture 3 State mark of organic products



Source: Union of Organic Farming, 2021

Only those agricultural enterprises that are included in the unified state register of organic producers can apply this sign. During the transition period, it is also not yet possible to label products as organic.

All other agricultural enterprises do not have the status of “organic” and can not label their products in this way.

Manufacturers included in the register of the Ministry of Agriculture of the Russian Federation since 02.03.2020 have the opportunity to put a QR-code on the packaging, which allows customers to use their phone to get information about the organic producer and its products.

In this way, Russia has built a transparent vertical control over the entire life cycle of production and certification of organic agricultural products in accordance with GOST 339-80-2016:

- Certification agencies receive accreditation according to the national standard GOST 33980-2016 in Rusaccreditation.
- Manufacturers are certified by accredited certification agencies.
- The transition period lasts 1-3 years. All this time, the products do not have the status of “organic”.
- The certification agency issues a certificate to the manufacturer.
- The Ministry of Agriculture of the Russian Federation enters the producer in the unified state register of producers of organic products.
- The manufacturer marks its products with a single state logo of organic products.

The interests of consumers of Russian organic products are legally protected. They can be sure that the production of products marked with the state organic sign has been checked throughout the entire life cycle from the field to the counter by the competent certification agencies. Both the manufacturer and the certification agency are legally responsible for the accuracy of the data.

State support for producers of organic products in Russia in accordance with Law No. 280-FL “On Organic Products and on Amendments to Certain Legislative Acts of the Russian Federation” is ensured in the manner and forms provided for by Federal Law No. 264-FL “On the Development of Agriculture” of December 29, 2006.

In June 2020, the Order of the Ministry of Agriculture of the Russian Federation of 24.04.2020 N 232 “On approval of the list of products of the agro-industrial complex, in respect of which compensation is provided to organizations of part of the costs associated

with the certification of agricultural products in foreign markets, under the subprogram “Development of sectors of the agro-industrial complex” State program of agricultural development and regulation of markets of agricultural products, raw materials and food” was issued. It approved the rules for providing state support to organic exporters.

The importance of encouraging Russian organic producers to enter foreign markets has been discussed for a long time. Since the cultivation of organic products reduces the yield and gross harvest, and therefore increases the cost. All these costs must be offset by high wholesale costs and significant demand. But the Russian market is not yet able to meet this demand due to the low purchasing power of most of the population, while abroad certified by international standards bio-products are popular. These are cereals, legumes and oilseeds. State support for the export of organic products will help Russian farmers gain a foothold in the world market. In December 2019, the procedure for granting such subsidies by the state was approved.

State subsidies for the first time in Russia are allocated to producers who supply Russian organic products for export. The amount of subsidies will be more than 50 percent. This document is one of the first in the state's support of organic agricultural producers at the federal level.

At the level of the constituent entities of the Russian Federation, measures are also being implemented to support producers of organic products. Thereby, a separate co-financing program operates in the Tomsk Region. It is the leader in the export of organic products to the EU countries. Over the past two years, the export of organic products from the Tomsk region has grown by 120%.

Producers of organic products of the Voronezh region are reimbursed from the regional budget:

- 100% of the cost of organic production certification;
- 50 % of the cost of biological protection products, nutrition, animal feed additives, veterinary drugs.

Currently, more than 10 agricultural enterprises that are in the transition and conversion period receive state support in the Voronezh Region as producers of organic products. They produce vegetables, grains and oilseeds, apples, and berries.

Producers of organic products in the Belgorod Region, the Krasnodar Territory, the Republic of Bashkortostan, the Republic of Komi and other regions are preparing to take measures to support them.

Small and medium-sized agricultural enterprises (SMEs) can receive state support through regional cluster development centers and various government bodies.

The measures taken in our country to provide state support to the organic market will allow us to form a stable segment of organic production that meets both the internal needs of customers and the requirements of importing countries.

### **3.6 Problems of the Russian organic sector**

Russia is at the beginning of its development of the organic market. At this stage, the primary tasks are the development of new technologies, the exchange of experience with foreign partners, training, consultations, scientific and technological cooperation, the establishment and expansion of sales channels for organic products.

In each country, the process of forming and developing the organic market has its own specific features and problems.

Russia is still poorly involved in the development of the organic market of agricultural products and this is due to a number of reasons. The most important ones are defined here.

- Imperfection of the regulatory framework for regulating the production and turnover of organic products.

Even before it entered into force on 01.01.2020. Federal Law No. 280-FL “On Organic Products and on Amendments to certain Legislative Acts of the Russian Federation” was adopted at the initiative of the National Organic Union, a number of standards on organic products that are currently in force. None of the four standards planned for adoption in 2020 has been adopted. Two of the most anticipated ones, on wild plants and biologics, have not even been publicly discussed.

The fact that the Russian Federation does not recognize international organic standards in accordance with Federal Law No. 280-FL, as well as the Russian organic standard is not recognized in the world, can also be considered a gap in the legislation.

Russian exporters of organic products found themselves outside the legal field. They continue and will continue passing certification according to the international standards of the EU countries (EU Regulations No. 889/2008, No. 834/2007, 1235/2008), the USA (NOP), Japan (JAS), as this is the main requirement of customers.

- Another important problem in the development of the organic market in Russia is the lack of centralized mechanisms for certification of organic products, as well as the lack of officially accredited certification companies. Organic certification in our country is at the

initial stage and it has not yet received proper development. Today, there is no sufficient regulatory framework that would regulate this issue, as well as the process of issuing such certificates.

As a result, there are problems, for example, for importers of organic products from abroad. Now it is planned to require them to pass the Russian certification. Considering the fact that in Russia there are about 80% imported organic products, this problem puts it at risk. (Pravovoy-standart, 2020).

- In the Russian Federation, there is no state statistical and departmental accounting of organic production (a system for collecting information on the number of producers, certified land, market volume, etc.). This means that everything is missing, on the basis of which further forecasts for its development are based.

“All that the market operates with today is some expert assessments, which are most often given by specialized unions, so we see a spread of figures by 2-4 times. It is impossible to build on this state policy,” said Oleg Mironenko, head of the National Organic Union (Interfax, 2020).

- Insufficient state support for organic producers.

Federal Law No. 280-FL did not fully launch federal and regional state support programs. Currently, companies that appear on the organic market come exclusively from their own investments, without any help from the federal authorities. Therefore, direct and indirect support from the state, which it provides to domestic producers of organic products, is not sufficient. There are no budget payments in the form of grants, benefits, compensations, including for the costs of certification services, given their high cost, as well as there is no information and consulting support for organic market operators, etc.

But state support is very necessary for manufacturers in the form of subsidies, concessional lending, tax preferences, a system of public procurement, etc.

- Now the number of organic producers in Russia is less than 100 and it is almost not growing. To compare, in Italy there are 42 thousand, in India 547 thousand. According to expert estimates, in order to meet the existing demand for Russian organic products, it is necessary to significantly increase the number of producers annually.

- Low purchasing power of the population. At a time when the real incomes of Russian citizens are actually declining for the eighth year in a row, and prices for organic products are 1.5-2 times higher than for conventional products, consumers are forced to buy cheaper non-organic products.

- The next problem is the lack of awareness of buyers about the benefits of certified organic products. Residents of Russia do not yet have sufficient knowledge in the field of organic products, as they are just beginning to get acquainted with it. Such incompetence of consumers allows unscrupulous manufacturers to deceive their customers with the help of such a phenomenon as greenwashing (literally – “green laundering”).

The phenomenon of greenwashing is used by unscrupulous manufacturers to mislead the consumer in order to present their product as environmentally friendly, organic, while it is not.

Often there are the products labeled "organic" on the same shelf with products marked “bio”, “eco”, “green product”, etc., misleading customers.

It's made in order to increase demand, as the desire of customers to purchase organic products is constantly increasing. Approximately 60% of consumers are interested in HLS products.

Due to the long presence of falsified “organic” products on the market, consumers distrust of organic producers and sellers arises. This undermines the reputation of all organic products that have passed certification, and the production of which meets the required standards.

Another problem is that information and communication technologies (ICTs) are practically not used, what make it possible to carry out information and consulting, advertising activities, trade in organic products, and control their quality in the process of product distribution much more effectively. The level of automation of production processes is very low and, as a result, there is no transparency of existing organic production. Without digitalization and the introduction of information technologies in the field of management, the activities of both large agricultural holdings and small businesses are impossible.

- A small number of Russian enterprises engaged in the processing of organic products. Currently, this is only 11% of the companies in the organic market of Russia. The development of the domestic organic processing sector would help Russia become less dependent on the import of processed products, in addition, it is more profitable to export processed products than raw materials.

- A small amount of scientific research in the field of development of the organic market is another problem that requires attention from the state.

- A serious deterrent can also be considered a lack of profile education, which is focused on training qualified personnel for organic production, as well as the lack of

retraining courses for agribusiness staff with the participation of producers of organic products.

Thus, the main reasons for the backlog of the Russian organic market from European countries and the United States are:

- Insufficient development of the legal and regulatory framework of the organic market;
- The absence of state programs for financing organic producers, the passive role of the state in this direction;
- Higher price of organic products compared to traditional products;
- Low purchasing power of the population;
- Insufficient level of knowledge of consumers about the features of organic products;
- The low standard of living of Russians, what has especially declined in recent years;
- Low level of automation of production processes, introduction of information technologies;
- Insufficient amount of scientific research in the field of organic market development;
- Lack of specialized education focused on the training and retraining of qualified personnel for organic production.

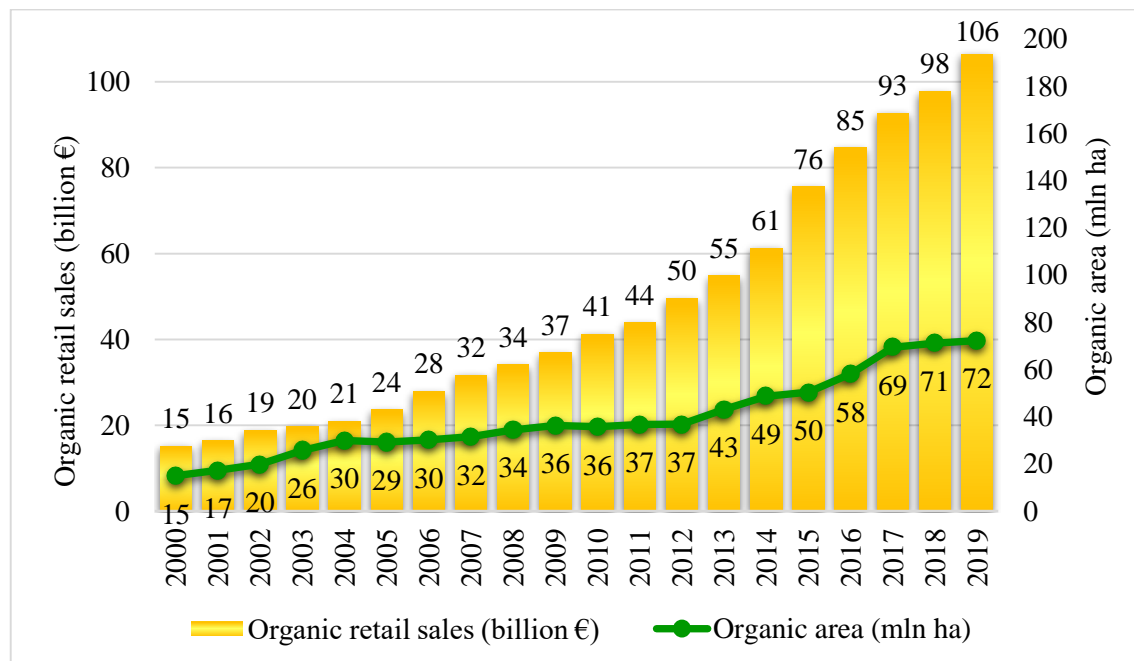
## 4 Practical Part

### 4.1 Analysis of the organic production in the world

#### 4.1.1 Development and the current state of the organic products market

Organic agriculture is a global trend, the organic area and market continues to grow steadily. The organic food market is one of the most promising and dynamically developing in the world. According to the data of the Research Institute of Organic Agriculture (FIBL) organic global market is estimated by 106 billion €.

Figure 1 Development of the organic products market in the world 2000-2019



Source: Compiled by the author based on the data from Research Institute of Organic Agriculture (FIBL)

For estimation the direction and intensity of changes in the organic retail sales through the time, I compared the levels of the dynamic series and calculated the system of dynamics characteristics: absolute growth, growth rate, and growth rate in percent. (Table 4).

In addition, I calculated the average values to obtain the generalized value of the indicator for the studied period, this allows to abstract from random fluctuations. (Table 5)



Table 4 Absolute growth and growth rate of the organic retail sales 2000-2019

Year	Organic retail sales (Million €)	Absolute growth (Million €)		Growth rate		Growth rate, %	
		basis	chain	basis	chain	basis	chain
2000	15156	-	-	-	-	-	-
2001	16355	1199	1199	1.1	1.1	8	8
2002	18797	3641	2442	1.2	1.1	24	15
2003	19615	4459	818	1.3	1.0	29	4
2004	20937	5781	1322	1.4	1.1	38	7
2005	23556	8400	2619	1.6	1.1	55	13
2006	27934	12778	4378	1.8	1.2	84	19
2007	31731	16575	3797	2.1	1.1	109	14
2008	34114	18958	2383	2.3	1.1	125	8
2009	36892	21736	2778	2.4	1.1	143	8
2010	41227	26071	4335	2.7	1.1	172	12
2011	43861	28705	2634	2.9	1.1	189	6
2012	49528	34372	5667	3.3	1.1	227	13
2013	54807	39651	5279	3.6	1.1	262	11
2014	61277	46121	6470	4.0	1.1	304	12
2015	75549	60393	14272	5.0	1.2	398	23
2016	84663	69507	9114	5.6	1.1	459	12
2017	92739	77583	8076	6.1	1.1	512	10
2018	97747	82591	5008	6.4	1.1	545	5
2019	106404	91248	8657	7.0	1.1	602	9

Source: The author's own calculations in Excel based on the data from Research Institute of Organic Agriculture (FiBL)

Table 5 Average values of the organic retail sales 2000-2019

Average values of the time series	2000-2019
Time series mean (Million €)	47644
Average annual absolute growth (Million €)	4562
Average annual growth rate, %	10.2

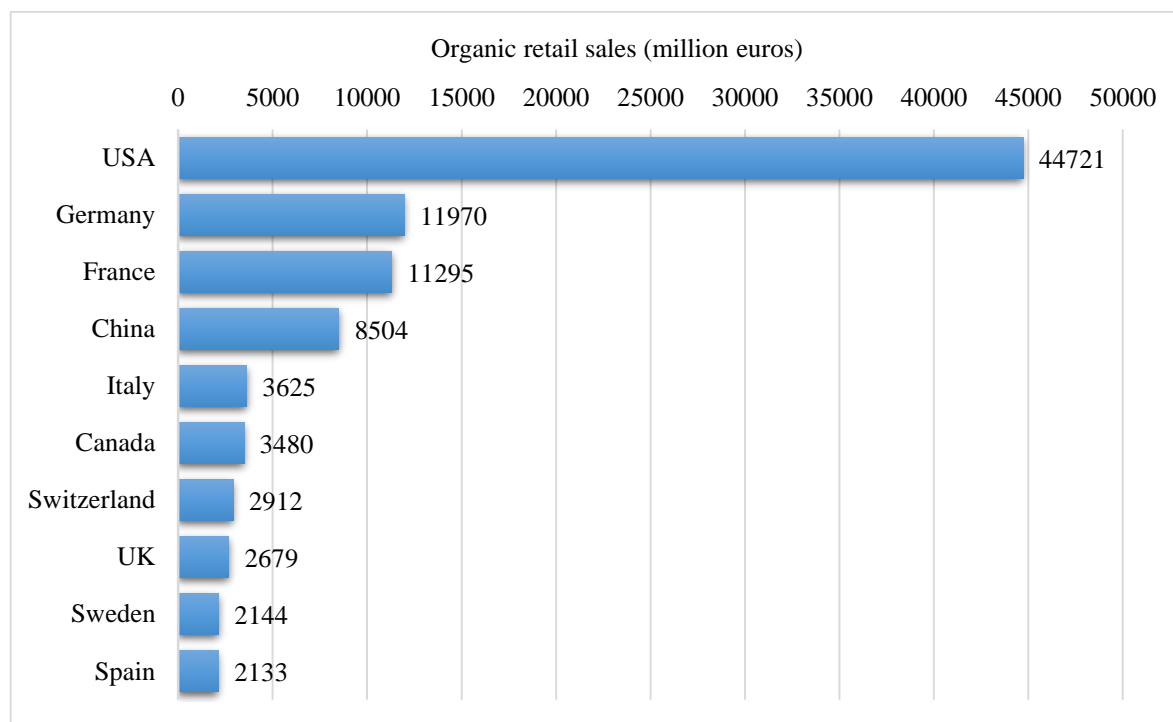
Source: The author's own calculations in Excel based on the data from Research Institute of Organic Agriculture (FiBL)

According to the calculations obtained, it can be concluded that from 2000 to 2019 the global market for organic products grew by more than seven times by 91 billion euros (from 15 to 106 billion euros), with an average annual absolute growth of 4562 million € and an average annual growth rate of 10.2%. And also it could be mentioned that the growth in consumption of organic products is more than 2 times higher than the growth rate of the food market as a whole.

The United States is the leader in terms of market volume for organic products. The US share is as much as 40% and their market is estimated at 44.7 billion euros. The main reason for such a significant US share in the global organic market is the fact that there is a high level of agricultural development. Such a high level of development allows satisfying the needs of the population, and in addition, provides a significant export surplus.

Further, with a huge lag are the countries of the European Union and China. For example, in Germany, the volume of organic sales in 2019 amounted to 12 billion euros, followed by France, whose market was approximately the same and was estimated at 11.3 billion euros, and then China followed with a slight lag behind European countries. Its market was valued at 8.5 billion euros. (Figure 2)

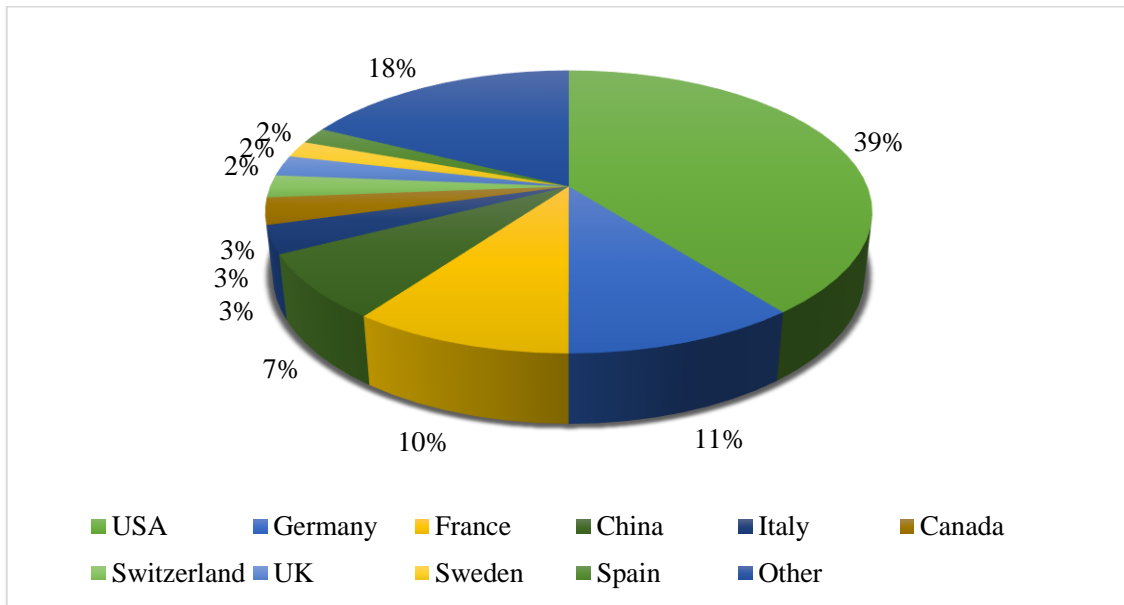
Figure 2 Countries with the highest market of organic products 2019



Source: Compiled by the author based on the data from Research Institute of Organic Agriculture (FIBL)

Today's demand is concentrated in the top 8 countries: USA, Germany, France, China, Italy, Canada, Switzerland, UK. Together, they consume almost 79% of the world's organic products. The structure of world consumption in 2019 is presented in the Figure 3.

Figure 3 The structure of world consumption in 2019 (%)



Source: Compiled by the author based on the data from Research Institute of Organic Agriculture (FiBL)

Despite the fact that today almost 79% of consumption is formed by 8 countries, there is demand in all countries where there is an increase of about 30-50% per year

In this way, consumption is growing not only in developed "rich" countries, but in general, in all regions, including "poor" countries, for example: in Europe: Latvia, Lithuania more than 50% per year, Ukraine, Bulgaria about 30% per year, as well in Asian markets: China-57%, India-30% (FiBL, 2019).

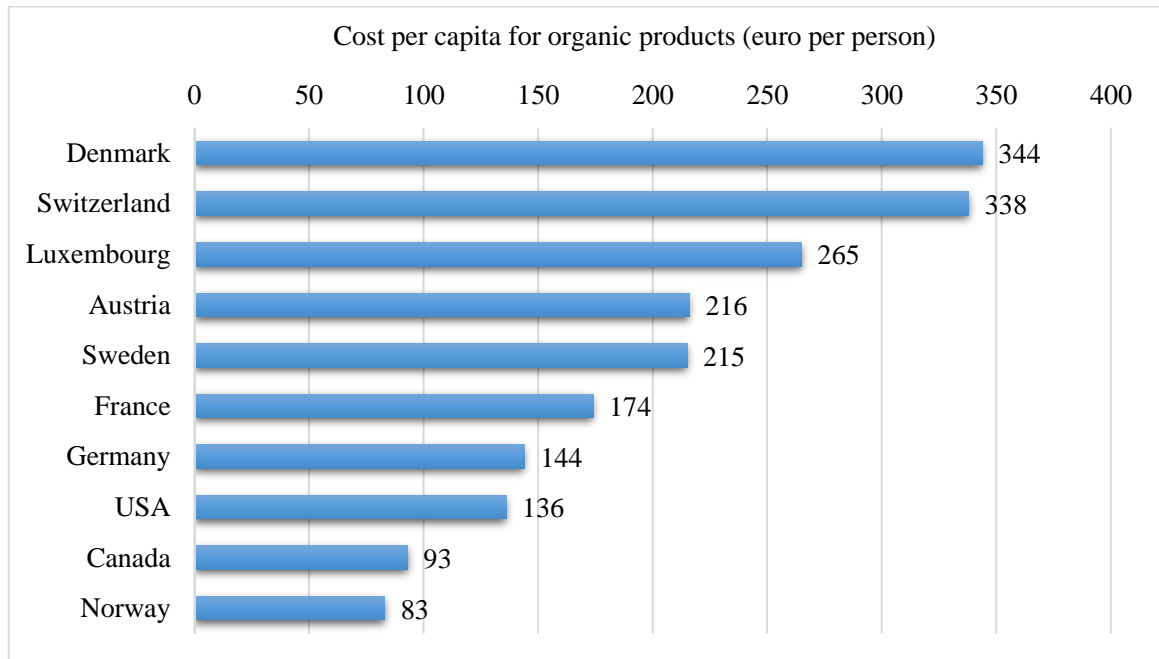
Further market growth will be associated with an increase in the number of consumers. Consumption is far from saturation and will grow as income rises and the cost of organic products decreases.

#### 4.1.2 Global consumption of organic products per capita

However, in terms of the volume of consumption of organic products, per capita, European countries are significantly ahead of all in the world (Figure 4). The main reasons for such localization in Europe are the high level of income of the population there, as well as the fact that a large proportion of the population strives to consume healthier food and, in addition, they are willing to pay for organic products 30-50% more than the price of a similar product.

Also, the reasons for this include the desire of the population to support agriculture, which does not lead to land depletion and is capable of reproduction in an unlimited time interval, and this is also associated with a developed legal framework in the field of organic agriculture as well as developed institutional environment.

Figure 4 Countries with the highest per capita cost for organic product 2019 (in euros)



Source: Compiled by the author based on the data from Research Institute of Organic Agriculture

In 2019, consumers in Denmark and Switzerland spent the most on organic products (344 and 338 euros per capita, respectively). It should also be noted that the market share of organic products in Denmark of the total food market was the largest at 12.1%.

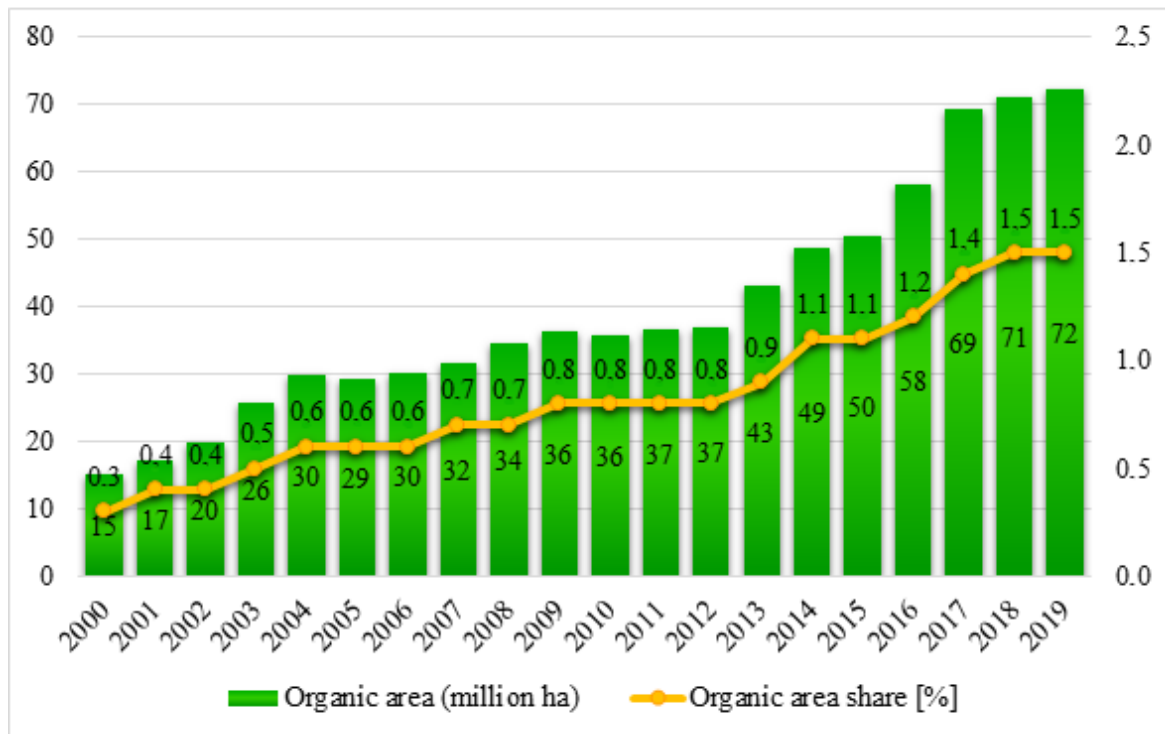
The main consumers of organic products include people with middle and high incomes, as well as those living in developed countries. An estimate of the number of people consuming organic products in the world shows that their number has increased approximately five times over the past 15 years to about 700 million people.

It can be concluded that developed markets for organic products have such common characteristics as, for example, these are countries with a high level of income, since the 10 countries with the highest consumption of organic products per capita are in the TOP-25 in terms of GDP per capita, and countries with a developed legal system. frameworks in the field of organic agriculture, countries with a developed institutional environment, as well as countries with developed organic production (close to production centers).

### 4.1.3 Development and the current state of the world organic farmland

According to FiBL, at the end of 2019, 72.3 million hectares of land for organic agriculture were certified and this accounted for 1.5% of all agricultural land in the world, in the production from wild plants 35.1 million hectares.

Figure 5 Development of the organic area in the world 2000-2019



Source: Compiled by the author based on the data from Research Institute of Organic Agriculture (FiBL)

For estimation the direction and intensity of changes in the organic farmland through the time, I compared the levels of the dynamic series and calculated the system of dynamics characteristics: absolute growth, growth rate, and growth rate in percent. (Table 6).

In addition, I calculated the average values to obtain the generalized value of the indicator for the studied period, this allows to abstract from random fluctuations. (Table 7)

Table 6 Absolute growth and growth rate of the organic area in the world 2000-2019

Year	Organic area (thousand ha)	Absolute growth		Growth rate		Growth rate, %	
		basis	chain	basis	chain	basis	chain
2000	14981	-	-	-	-	-	-
2001	17302	2321	2321	1.15	1.15	15.50	15.50
2002	19879	4898	2577	1.33	1.15	32.70	14.89
2003	25765	10784	5886	1.72	1.30	71.99	29.61
2004	29973	14992	4208	2.00	1.16	100.07	16.33
2005	29246	14265	-727	1.95	0.98	95.22	-2.43
2006	30173	15192	927	2.01	1.03	101.41	3.17
2007	31510	16529	1336	2.10	1.04	110.33	4.43
2008	34473	19492	2963	2.30	1.09	130.11	9.40
2009	36271	21290	1798	2.42	1.05	142.11	5.22
2010	35714	20733	-557	2.38	0.98	138.39	-1.53
2011	36671	21690	957	2.45	1.03	144.78	2.68
2012	36833	21852	162	2.46	1.00	145.86	0.44
2013	43068	28087	6235	2.87	1.17	187.48	16.93
2014	48695	33714	5627	3.25	1.13	225.04	13.06
2015	50365	35384	1670	3.36	1.03	236.19	3.43
2016	58091	43110	7725	3.88	1.15	287.76	15.34
2017	69411	54430	11321	4.63	1.19	363.33	19.49
2018	71173	56192	1761	4.75	1.03	375.09	2.54
2019	72286	57305	1113	4.83	1.02	382.52	1.56

Source: The author's own calculations in Excel based on the data from Research Institute of Organic Agriculture (FIBL)

Table 7 Average values of the organic retail sales 2000-2019

Average values of the time series	2000-2019
Time series mean (thousand ha)	39594
Average annual absolute growth (thousand ha)	2865
Average annual growth rate, %	8.19

Source: The author's own calculations in Excel based on the data from Research Institute of Organic Agriculture (FIBL)

The area of certified organic land increased by 57 million hectares during the study period. Thus, in 2019, compared to 2000, land for organic farming increased 4.8 times with an average absolute growth of 2.8 million hectares and an average growth rate of 8.2%.

The organic segment began to attract the attention of producers only after 2010, but nevertheless, already in 2019, 1.5% of all agricultural land in the world was already under organic farming. Therefore, the low rate of land expansion for organic farming is one of the factors that limited market growth until the 2010s.

Table 8 Distribution Organic agricultural land and organic share of total agricultural land by region 2019

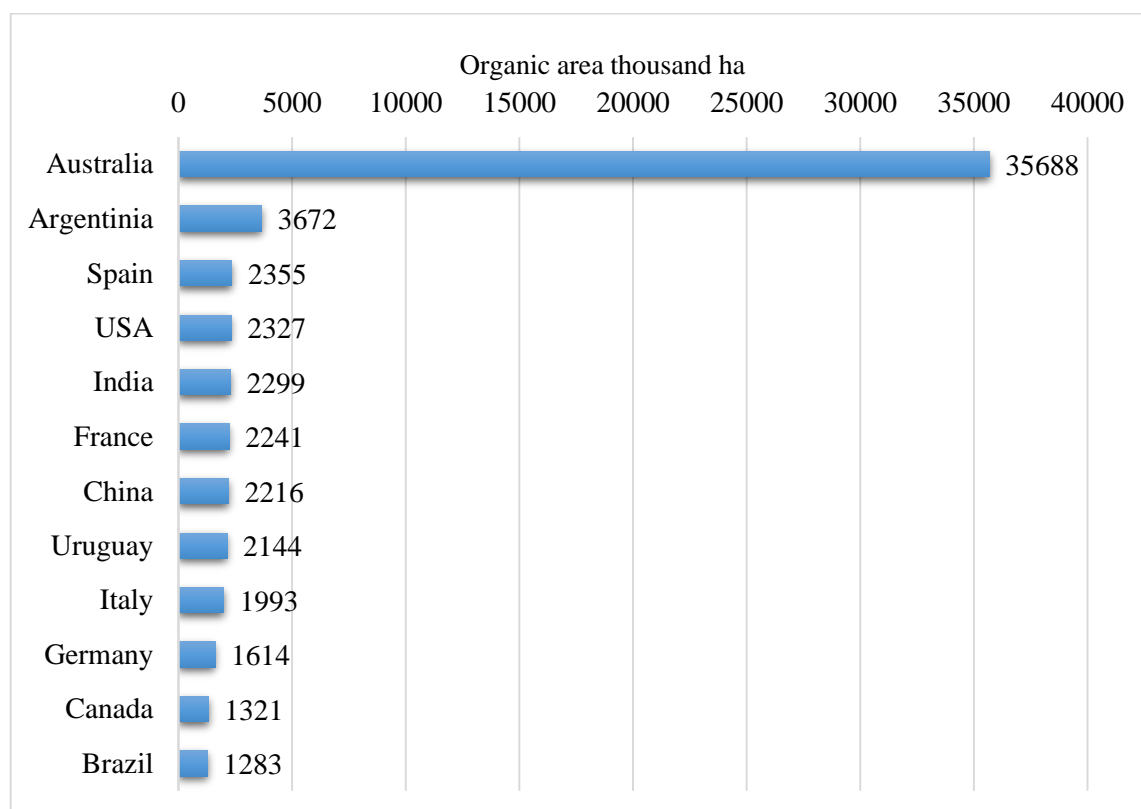
Region	Organic agri. land (ha)	Share of total agricultural land (%)	1 year growth (ha)	1 year growth (%)
Africa	2030830	0.2%	176184	9.5%
Asia	5911622	0.4%	-453156	-7.1%
Europe	16528677	3.3%	921042	5.9%
Latin America	8292139	1.2%	283559	3.5%
North America	3647623	0.8%	304774	9.1%
Oceania	35881053	9.6%	-118320	-0.3%
World	72285656	1.5%	1112873	1.6%

Source: FiBL survey 2021

Half of all organic agricultural land in the world is located in Oceania and covers 36.0 million hectares, primarily due to the large area of organic agricultural land in Australia. After Oceania, in terms of organic land, Europe comes with 16.5 million hectares, followed by Latin America, which is estimated by FiBL at 8.3 million hectares. Organic land area has increased on all continents compared to 2018, except Asia (mainly due to a decrease in organic agricultural land from China) and Oceania.

The location of land for organic farming usually coincides with the centers of consumption. However, organic products have a high potential for international trade. This factor has led to the active development of export-oriented organic agriculture in countries such as Australia, Argentina and China.

Figure 6 Countries with the most organic farmland 2019



Source: Compiled by the author based on the data from Research Institute of Organic Agriculture (FIBL)

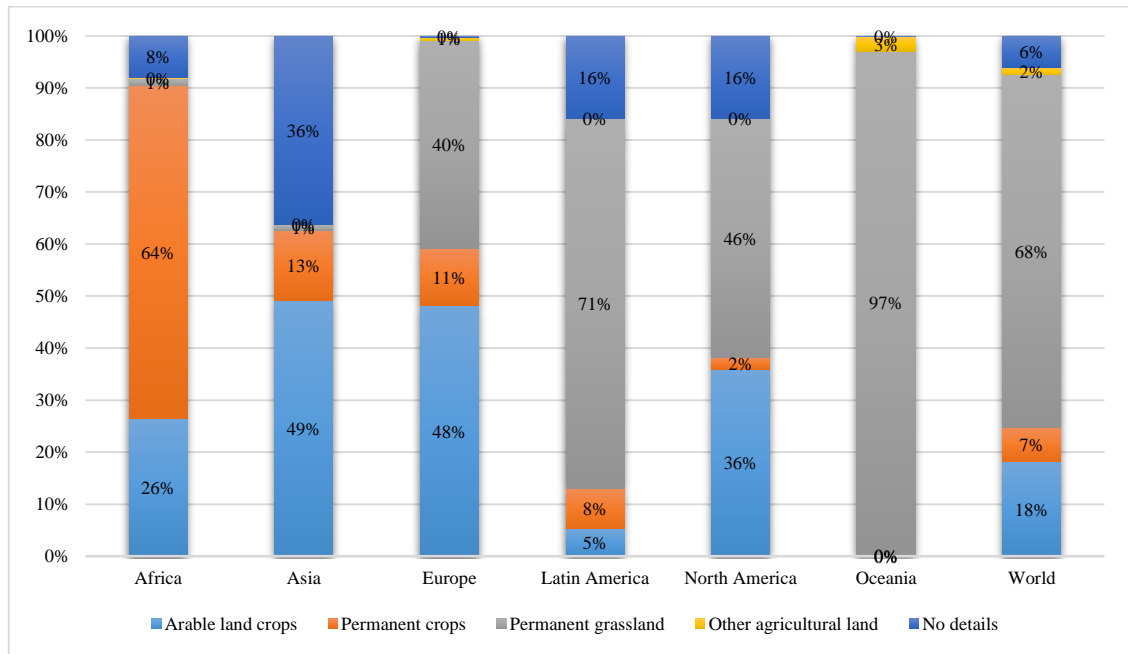
Australia has the largest area of certified organic agricultural land, accounting for 35.7 million hectares and 51% of the global value. It is followed by Argentina (3.7 million ha) and Spain (2.4 million ha). Finland is the leader in the production of products from wild plants with 4.6 million hectares.

#### 4.1.4 Distribution of main organic land use types by region

Most countries are significantly behind Australia in this indicator. However, an important factor here is the structure of these lands. The figure 7 shows distribution of main organic land use types by region in 2019.



Figure 7 Distribution of main organic land use types by region 2019



Source: Compiled by the author based on the data from Research Institute of Organic Agriculture (FIBL)

As you can see from the figure 7 almost 70% of the certified lands in the world are pastures, the certification of which is simpler and the financial investment in maintaining them in an organic state is minimal. It is this type of use that drives the high growth rate, since livestock grazing is the main use of the land - it grows twice as fast as others. However, more important here is the amount of land under arable land. The number of such lands does not exceed 20%.

The type of land use for "organic" depends on the availability of specialization of the region in one of the agricultural segments. The most balanced regions in terms of land use are Europe and North America, in other regions their specialization can be traced.

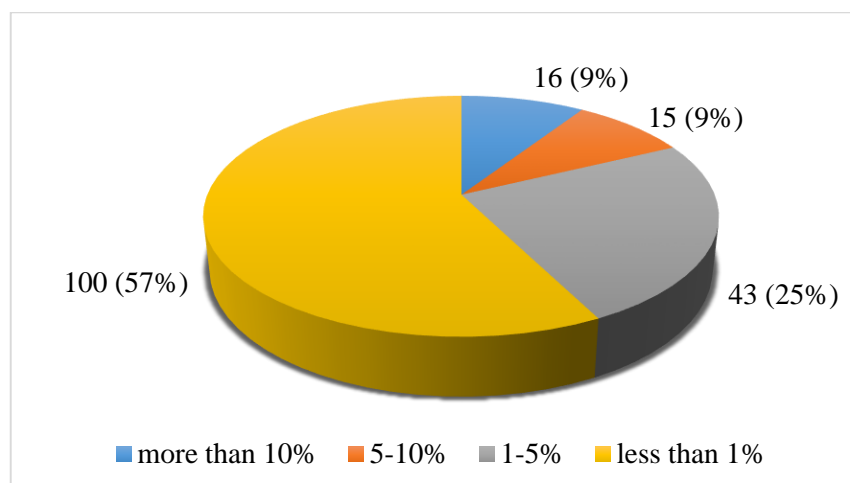
If we consider the structure of Australia's lands, then its advantage in terms of the number of certified lands becomes clear. Most of the organic land in Australia is grassland, and there are problems with droughts and low soil fertility.

Of course, the United States is the leading country in terms of the area of arable land, but I would like to note the fact that Russia has huge potential in this area, as it has more than 30 million fallow lands (i.e. agricultural land that has not been used for a long time, which means they have not introduced "chemistry"), most of which are arable land.

#### 4.1.5 Share of organic farmland used to the total agricultural land

An important indicator is the share of land used for organic farming to the total volume of agricultural land (Figure 8).

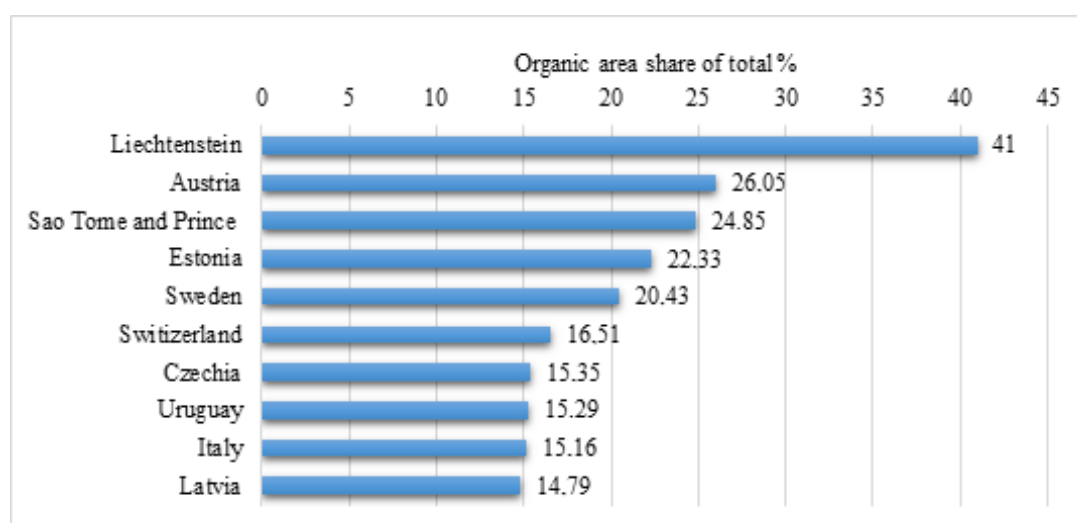
Figure 8 Share by countries of land used for organic to the total agricultural land 2019 (%)



Source: Compiled by the author based on the data from Research Institute of Organic Agriculture (FIBL)

Worldwide, 1.5% of agricultural land is organic. In more than 57% of countries this indicator does not exceed 1%. In sixteen countries (mostly European), 10 percent or more of all agricultural land is organic. In Russia, it accounts for only 0.1% of all agricultural land.

Figure 9 Countries with the highest organic area share of total agriculture lands 2019 (%)



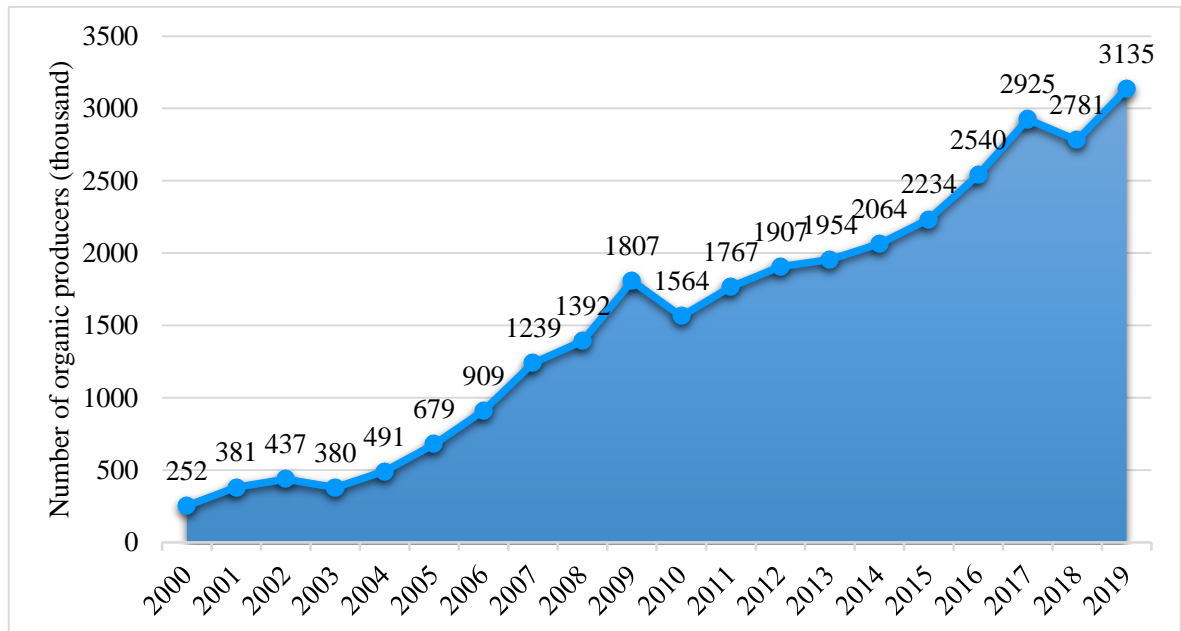
Source: Compiled by the author based on the data from Research Institute of Organic Agriculture (FIBL)

When considering countries in terms of the share of organic agricultural land, in this case the leaders are Liechtenstein, whose share is 41%, Austria with 26.1%, and Sao Tome and Principe, whose share is 24.9%. However, it can be assumed that the high share rates are due to the small size of these states (Figure 9). Several states in India are aiming to become 100% organic in the coming years.

#### 4.1.6 Development of the organic producers

According to the data from Research Institute of Organic Agriculture (FIBL) in total, more than 3.1 million producers are certified worldwide in 2019.

Figure 10 Development of the organic producers in the world 2000-2020



Source: Compiled by the author based on the data from Research Institute of Organic Agriculture (FIBL)

For estimation the direction and intensity of changes in the organic retail sales through the time, I compared the levels of the dynamic series and calculated the system of dynamics characteristics: absolute growth, growth rate, and growth rate in percent. (Table 9).

In addition, I calculated the average values to obtain the generalized value of the indicator for the studied period, this allows to abstract from random fluctuations. (Table 10)

Table 9 Absolute growth and growth rate of the organic producers in the world 2000-2020

Year	Organic producers	Absolute growth (number of organic producers)		Growth rate		Growth rate (%)	
		basis	chain	basis	chain	basis	chain
2000	252040	-	-	-	-	-	-
2001	380661	128621	128621	1.51	1.51	51.03	51.03
2002	437246	185206	56585	1.73	1.15	73.48	14.86
2003	379931	127891	-57315	1.51	0.87	50.74	-13.11
2004	491166	239126	111235	1.95	1.29	94.88	29.28
2005	678598	426558	187432	2.69	1.38	169.24	38.16
2006	909380	657340	230782	3.61	1.34	260.81	34.01
2007	1239096	987056	329716	4.92	1.36	391.63	36.26
2008	1391568	1139528	152472	5.52	1.12	452.12	12.31
2009	1806927	1554887	415359	7.17	1.30	616.92	29.85
2010	1564348	1312308	-242579	6.21	0.87	520.67	-13.42
2011	1766789	1514749	202441	7.01	1.13	601.00	12.94
2012	1906916	1654876	140127	7.57	1.08	656.59	7.93
2013	1954034	1701994	47118	7.75	1.02	675.29	2.47
2014	2063935	1811895	109901	8.19	1.06	718.89	5.62
2015	2233825	1981785	169890	8.86	1.08	786.30	8.23
2016	2539671	2287631	305846	10.08	1.14	907.65	13.69
2017	2925492	2673452	385821	11.61	1.15	1060.73	15.19
2018	2781011	2528971	-144481	11.03	0.95	1003.40	-4.94
2019	3135436	2883396	354425	12.44	1.13	1144.02	12.74

Source: The author's own calculations in Excel based on the data from Research Institute of Organic Agriculture (FIBL)

Table 10 Average values of the organic retail sales 2000-2020

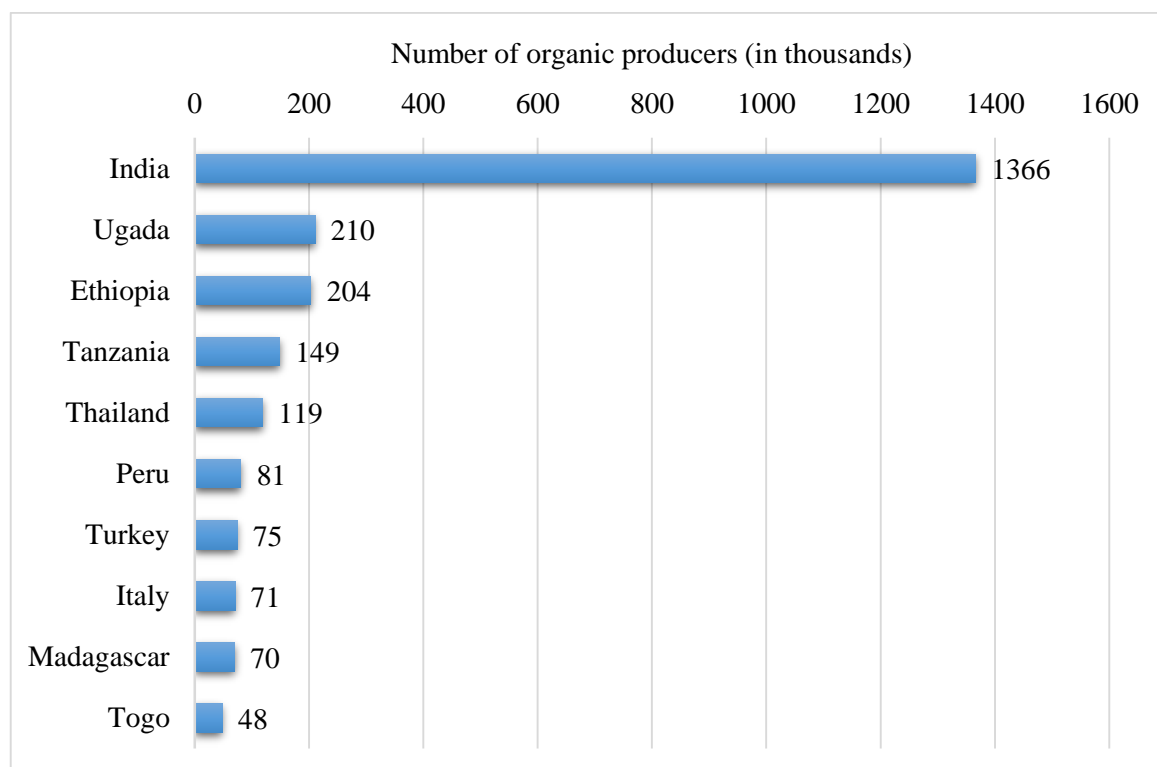
Average values of the time series	2000-2019
Time series mean (number of organic producers)	1541904
Average annual absolute growth (number of organic producers)	144170
Average annual growth rate (%)	13.4

Source: The author's own calculations in Excel based on the data from Research Institute of Organic Agriculture (FIBL)

Based on the results obtained, I can conclude that there has been an increase in the number of producers by almost 3 million or over 12 times over the past twenty years with average annual absolute growth of 144 thousand producers and average annual growth rate of 13.4%.

In the countries of the European Union, the market for the consumption of organic products is growing very fast, but at the same time it is growing faster than their production. And the fact that the largest number of organic producers are located in India, Uganda, Ethiopia and Tanzania (Figure 11) is due to the fact that the US and European countries see emerging markets as the most promising in terms of consumption.

Figure 11 Countries with the largest number of certified organic producers 2019



Source: Compiled by the author based on the data from Research Institute of Organic Agriculture (FIBL)

India has the largest number of organic growers at 1366000, followed by Uganda (210,000) and Ethiopia (204,000). Most of the small producers go through group certification based on an internal control system.

However, I would like to note that in this case, on average, one enterprise accounts for no more than 3-4 hectares, while in Russia and the USA this indicator can range from 100 to several thousand hectares of land. In Europe, this figure is at the level of 20-25 hectares.

#### 4.1.7 Forecasting the development of key indicators organic farming

To assess the prospects for the development of the world organic sector, it is necessary to identify the main trend in the development of key indicators using the analytical smoothing method, and calculate their forecast until 2025.

After analyzing the graphs and comparing the coefficient of determination and residual variance with other trend functions for the indicator organic farmlands, a linear function was chosen in the form  $y = 2774,5x + 10462$ , for the number of organic producers, the linear function  $y = 153506x - 69908$  was evaluated as the best option, and finally, for organic retail sales, the exponential function  $y = 13043e^{0,1059x}$  was chosen as well, because this functions have the most high value of the coefficient of determination and the smallest residual variance, therefore this equations better displays the values of the considering time series.

The estimation of the significance of the regression equations and their parameters, based on the Student and Fisher criteria, showed that they can be used to construct a forecast.

Table 11 Forecast of the organic areas in the world for 2020-2025 (thousand ha)

Year	Forecast value	Average forecast error	Confidence interval	
2020	68727	5776	62950	74503
2021	71501	5854	65647	77355
2022	74276	5938	68337	80214
2023	77050	6028	71022	83078
2024	79825	6123	73702	85947
2025	82599	6223	76376	88822

Source: The author's own calculations in Excel based on the data from Research Institute of Organic Agriculture (FIBL)

Thus, a forecast was obtained for organic areas in the world till 2025 and it could be concluded that in 2025 organic farmland can reach 82.5 million hectares with an average error of 6 million hectares. With a confidence level of 95%, it can be guaranteed that organic lands will be no lower than 76.4 and no higher than 88.8 million hectares.

Table 12 Forecast of the organic producers in the world for 2020-2025

Year	Forecast value	Average forecast error	Confidence interval	
2020	3153718	171704	2982014	3325422
2021	3307224	174024	3133200	3481248
2022	3460730	176521	3284209	3637251
2023	3614236	179186	3435050	3793422
2024	3767742	182013	3585729	3949755
2025	3 921 248	184994	3736254	4106242

Source: The author's own calculations in Excel based on the data from Research Institute of Organic Agriculture (FIBL)

Based on the obtained results of the forecast for number of organic producers in the world till 2025 could be concluded that in 2025 organic producers can grow to almost 4 million with an average error of 184 thousand producers. With the 95% probability at the significance level  $\alpha = 0.05$ , it can be guaranteed that number of organic producers will be no lower than 3.7 million and no higher than 4.1 million.

Table 13 Forecast of the organic products market in the world for 2020-2025 (million US\$)

Year	Forecast value	Average forecast error	Confidence interval	
2020	120560	2228	118333	122788
2021	134028	2258	131771	136286
2022	149001	2290	146711	151291
2023	165646	2325	163321	167971
2024	184150	2362	181789	186512
2025	204722	2400	202322	207122

Source: The author's own calculations in Excel based on the data from Research Institute of Organic Agriculture (FIBL)

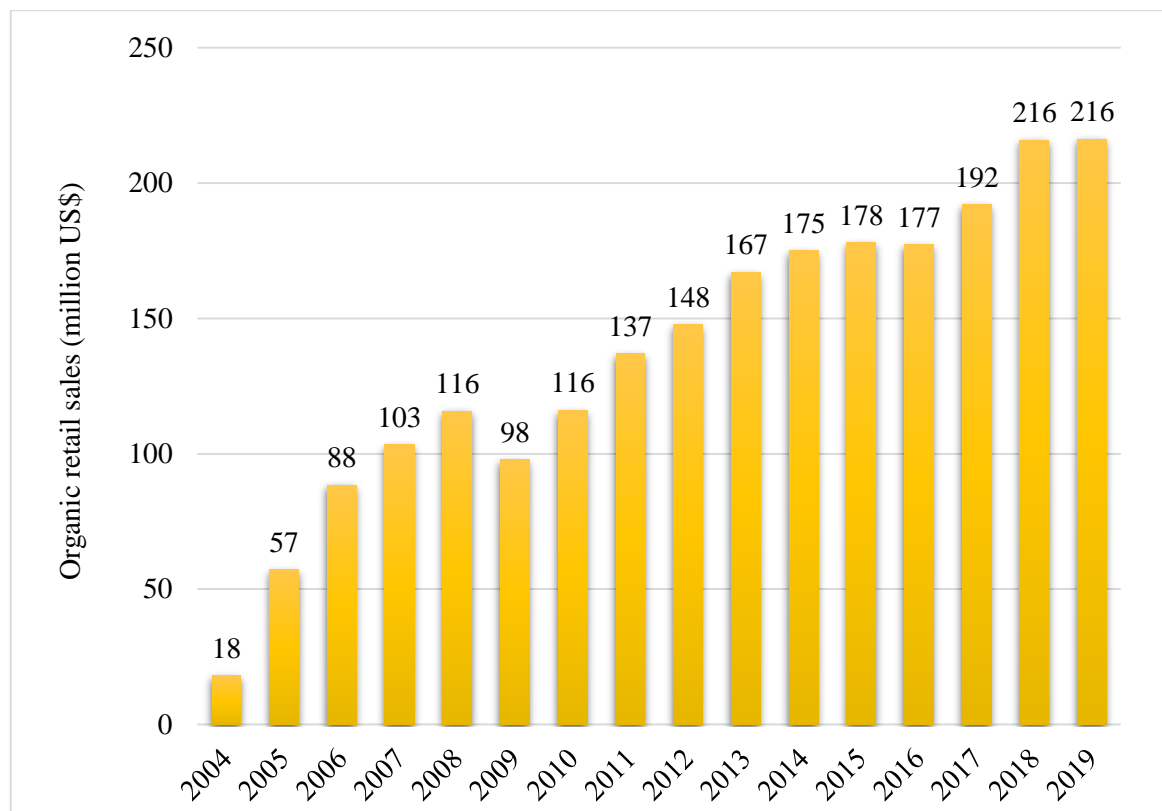
Based on the obtained forecast for organic sales in the world until 2025, it can be concluded that by 2025 the global organic market can reach 204 billion US \$ with an average error of 2.4 billion US \$. With a 95% probability at a significance level of  $\alpha = 0.05$ , it can be guaranteed that organic retail sales will be at least 202 and not higher than 207 billion US \$.

## 4.2 Analysis of organic production in Russia

### 4.2.1 Development and the current state of the organic products market

At the 2004, Russian organic market was 18 million dollars and 100 % of these products were imported from abroad, and by 2019 it has reached the value of 216 million dollars and it is already 20% of domestic certified products.

Figure 12 Development of the organic retail sales in Russia 2004-2019



Source: Compiled by the author based on the data from to the National Organic Union of Russia and Euromonitor

For estimation the direction and intensity of changes in the organic retail sales through the time, I compared the levels of the dynamic series and calculated the system of dynamics characteristics: absolute growth, growth rate, and growth rate in percent. (Table 14).

In addition, I calculated the average values to obtain the generalized value of the indicator for the studied period, this allows to abstract from random fluctuations. (Table 15).



Table 14 Absolute growth and growth rate of the organic retail sales in Russia 2004-2019

Year	Organic retail sales (million US\$)	Absolute growth (million US\$)		Growth rate		Growth rate (%)	
		basis	chain	basis	chain	basis	chain
2004	18.0	-	-	-	-	-	-
2005	57.2	39.2	39.2	3.2	3.2	217.8	217.8
2006	88.4	70.4	31.2	4.9	1.5	391.1	54.5
2007	103.2	85.2	14.8	5.7	1.2	473.3	16.7
2008	115.8	97.8	12.6	6.4	1.1	543.3	12.2
2009	97.7	79.7	-18.1	5.4	0.8	442.8	-15.6
2010	116.0	98.0	18.3	6.4	1.2	544.4	18.7
2011	137.0	119.0	21.0	7.6	1.2	661.1	18.1
2012	147.7	129.7	10.7	8.2	1.1	720.6	7.8
2013	167.0	149.0	19.3	9.3	1.1	827.8	13.1
2014	175.0	157.0	8.0	9.7	1.0	872.2	4.8
2015	178.0	160.0	3.0	9.9	1.0	888.9	1.7
2016	177.2	159.2	-0.8	9.8	1.0	884.4	-0.5
2017	192.0	174.0	14.8	10.7	1.1	966.6	8.4
2018	215.8	197.8	23.8	12.0	1.1	1098.9	12.4
2019	216.1	198.1	0.3	12.0	1.0	1100.7	0.2

Source: The author's own calculations in Excel

Table 15 Average values of the Organic retail sales 2004-2019

Average values of the time series	2004-2019
Time series mean (million US\$)	137.6
Average annual absolute growth (million US\$)	12.4
Average annual growth rate, %	16.8

Source: The author's own calculations in Excel

The Russian organic market has been growing rapidly since 2004 till 2019, increasing by more than 12 times to 216 million dollars with average absolute growth of 12.4 million US\$. The average growth rate is 16.8% per year for the considering period. Therefore, the organic market in Russia grew by 1.8 times faster than the global organic market (10.2%).

Table 16 Average growth ratios in selected periods

Period	Average annual growth rate (%)
2010-2013	9.54
2014-2016	0.42
2017-2019	4.03

Source: The author's own calculations in Excel

On average, since 2010, growth has been approximately 8.6% per year, but because of the decline in real incomes, the rate of market growth has slowed significantly since 2014: 2014-2016 growth was approximately 0.42% per year. In the period 2017-2019, the situation began to recover, and on average there is an increase of 4.03% annually.

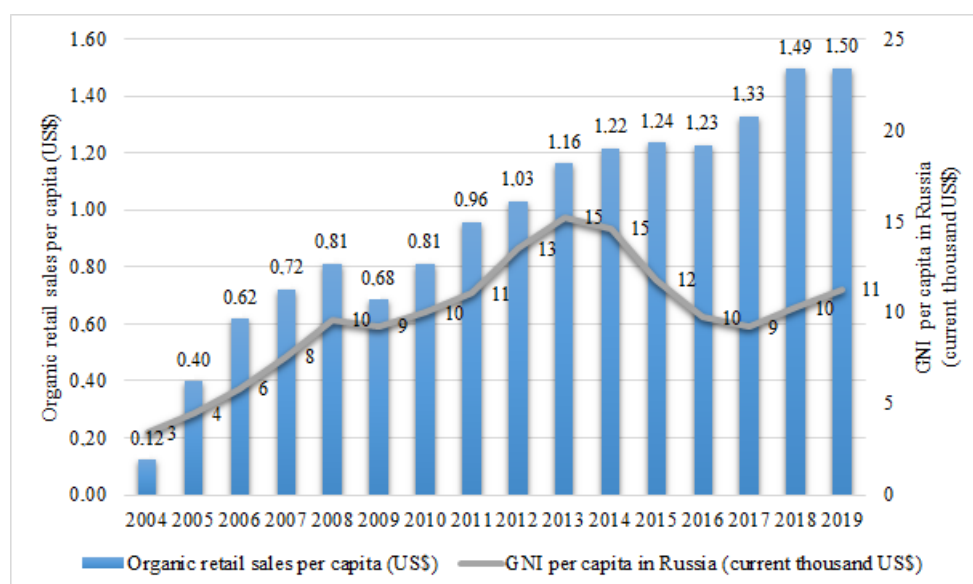
In general, I can conclude that there is a steady growth trend. But despite good growth indicators, the market is at the initial stage of formation and share of Russia in the global market is only 0.17%. (0.1% - organic's share in the Russian food market, 1% of the population-consumers)

But at the same time, Russia has significant opportunities to implement an organic system: the natural conditions, low level of environmental pollution, development of transport infrastructure, availability of land

#### 4.2.2 Consumption of organic products per capita

The indicator of the volume of consumption of organic products per capita is one of the main indicators characterizing the main difference between Russia and European countries, since, for example, in Switzerland the cost of buying organic products per capita is estimated at 288 euros, in Russia this figure is only 1 euros per capita. The sustainable group in terms of consumption of organic products is less than 1% of the population.

Figure 13 Organic retail sales per capita in Russia 2004-2019



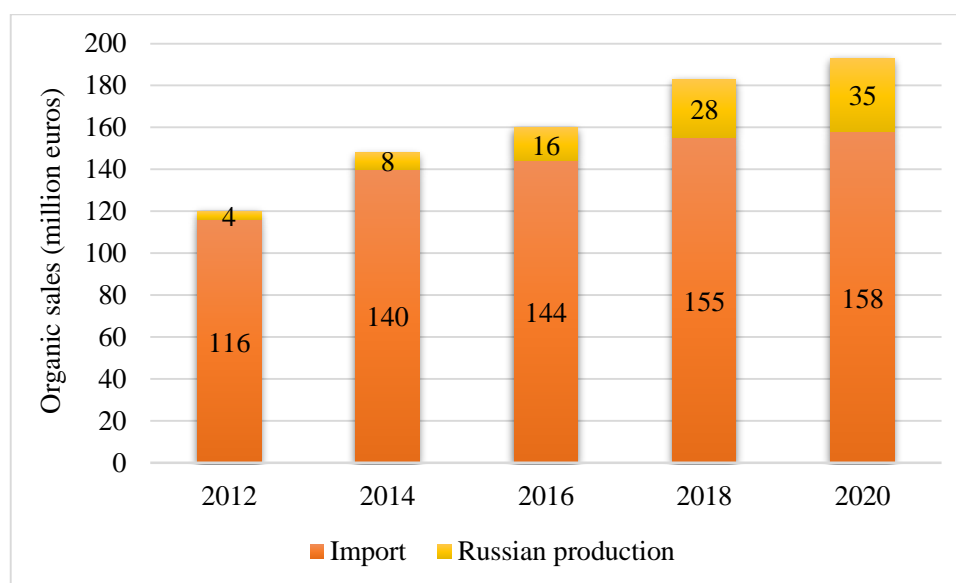
Source: Compiled by the author based on the data of the National Organic Union of Russia

The main factors that limit the demand for organic products include, first of all, the high cost of such products, since the difference in price between an ordinary product and an organic one can be 2-4 times greater in Russia, while in the European Union and the USA this the difference is much lower (about 15-50%). The incomplete legislative regulation of production is also affected, as well as the low level of public awareness of organic products.

#### 4.2.3 Exports and imports of organic products

Organic products produced in Russia are partially exported, but most of them are consumed domestically. Together with imported organic products, they form total domestic consumption. The main part of consumed organic products is organic food products sold in fresh and processed form.

Figure 14 Organic market structure in Russia (million euros)



Source: Compiled by the author based on the data of the National Organic Union of Russia 2021

Before the food embargo was introduced, about 90% of organic products in Russia were imported mainly from such countries of the European Union as Germany, France, Italy.

Russia exports part of its organic products, despite the fact that imported organic products occupy a significant share in its market.

The volume of Russian organic exports, according to FiBL and IFOAM, is still quite small and in 2019 was estimated at 4.0 million euros.

Russia in a relatively short time and without large investments can significantly increase the volume of exports of products with high added value - organic food.

The most important export market for Russia is grain. Today, more than 60 thousand hectares of land have been certified for the export of grain, oilseeds and fodder crops in Russia. There are 10 companies certified by international certifiers in this area. Most of them are united in the "Association of Organic Producers and Exporters". The leader and organizer of the association is the Tomsk company SIBIOPRODUCT. In 2019, members of the association certified 35 thousand hectares of arable land for export, another 15 are in a state of conversion.

#### 4.2.4 Structure of distribution channels for organic products

In general, organic products on the Russian domestic market are 2-4 times more expensive than their traditional equivalents, and products are sold mainly through chain and other stores, as well as through the Internet (table 17).

In terms of geography, the most promising centers for trade in organic products are Moscow and St. Petersburg, which currently account for about 65-70% of sales (of which approximately 70% Moscow, 30% Petersburg) (Organic national Union, 2021).

Table 17 Distribution channels by country (%)

Country	Share of sales through various distribution channels,%				
	Supermarkets	Specialty Stores	Organic supermarkets	Direct sales of producers	Other channels (bakeries, online shopping, etc.)
Denmark	90.0%	4.0%	-	6.0%	-
France	45.0%	12.0%	26.0%	12.0%	-
Italy	86.5%	13.5%	-	-	-
Great Britain	72.3%	15.0%	-	2.8%	9.9%
USA	54.0%	39.0%		7.0%	
Russia	50.0%	20-25%	25-30%		

Source: Compiled by the author based on data from the National Organic Union

In the table 17 the main sales channels for organic products in Western countries and Russia are given. The most significant channel for the sale of organic products in these countries is supermarkets. The share of supermarkets is 45 to 90% of the total sales structure

Eco-friendly supermarkets and specialty stores are also popular in the USA and France, for example. There their share is estimated at about 38-39%, while in other Western

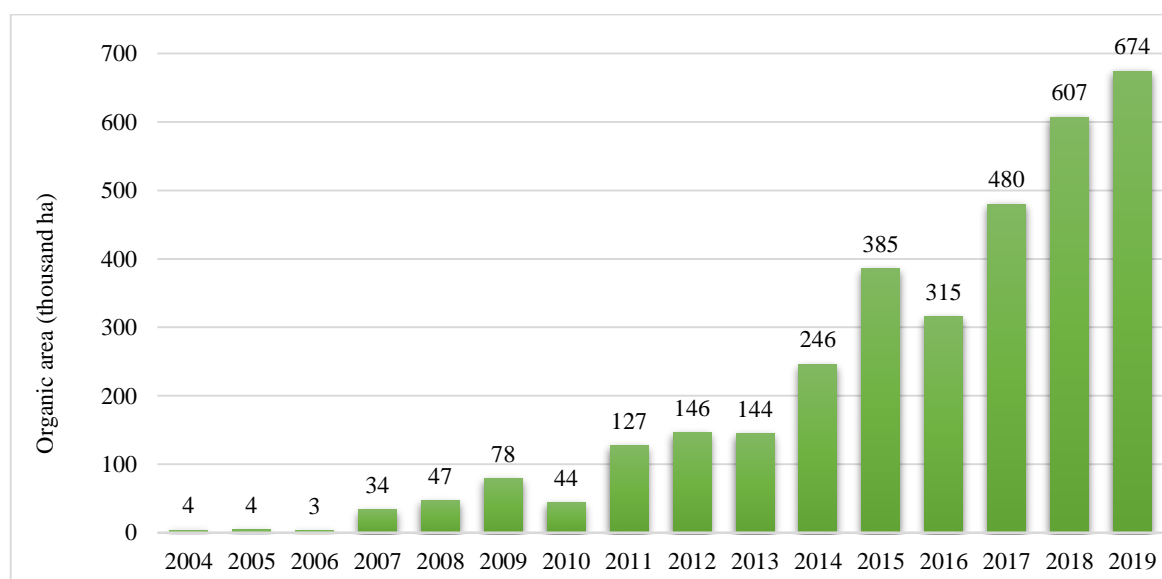
countries the share is about 4-15%. In addition, it can be noted that in France direct sales are practiced in farmer's shops, markets, and so on. (12%). In the UK, a relatively high proportion is occupied by other sales channels (9.9%), among which the most popular is online trade.

In terms of this indicator, the situation in Russia is similar to the situation in the leading countries of the world (Table 17). Supermarkets are also the most significant channel for the sale of organic products in Russia. They account for more than 50% of the overall structure. The share of specialized stores for organic products is 20-25% and they are also popular. The remaining share comes from direct sales, sales in markets, via the Internet, etc.

#### 4.2.5 Development and the current state of the organic area

The organic market growth was accompanied by an active growth of agricultural land for organic farming. At the end of 2019, about 674 thousand hectares of land for organic agriculture were certified. Russia ranks 13rd in the world in the number of certified land and one of the first in its growth (FiBL, 2019). But at least 30% of this amount is certified for future projects (i.e. the land is either in conversion or idle). This is typical for Russia, where there is a lot of land, in European countries the amount of certified land is almost equal to the amount of cultivated land.

Figure 15 Development of organic farmland in Russia 2004-2020



Source: Compiled by the author based on the data of the from Research Institute of Organic Agriculture (FiBL)

For estimation the direction and intensity of changes in the organic farmland through the time, I compared the levels of the dynamic series and calculated the system of dynamics characteristics: absolute growth, growth rate, and growth rate in percent. (Table 18).

In addition, I calculated the average values to obtain the generalized value of the indicator for the studied period, this allows to abstract from random fluctuations. (Table 19)

Table 18 Absolute growth and growth rate of the organic farmland in Russia 2004-2019

Year	Organic area (thousand ha)	Absolute growth (thousand ha)		Growth rate		Growth rate, %	
		basis	chain	basis	chain	basis	chain
2004	3.67	-	-	-	-	-	-
2005	4.05	0.38	0.38	1.10	1.10	10.39	10.39
2006	3.19	-0.48	-0.86	0.87	0.79	-12.95	-21.15
2007	33.80	30.13	30.61	9.22	10.59	821.76	958.93
2008	46.96	43.30	13.16	12.81	1.39	1180.67	38.94
2009	78.45	74.78	31.49	21.39	1.67	2039.30	67.05
2010	44.02	40.35	-34.43	12.00	0.56	1100.33	-43.89
2011	126.85	123.18	82.83	34.59	2.88	3359.15	188.18
2012	146.25	142.58	19.40	39.88	1.15	3888.27	15.30
2013	144.25	140.59	-2.00	39.34	0.99	3833.82	-1.37
2014	245.85	242.18	101.59	67.04	1.70	6604.25	70.43
2015	385.14	381.47	139.29	105.03	1.57	10402.84	56.66
2016	315.15	311.49	-69.99	85.94	0.82	8494.33	-18.17
2017	479.83	476.16	164.67	130.85	1.52	12985.03	52.25
2018	606.97	603.31	127.15	165.52	1.26	16452.33	26.50
2019	674.37	670.70	67.40	183.90	1.11	18290.24	11.10

Source: The author's own calculations in Excel based on the data from Research Institute of Organic Agriculture (FIBL)

Table 19 Average values of the Organic area 2004-2019

Average values of the time series	2004-2019
Time series mean (thousand ha)	208.67
Average annual absolute growth (thousand ha)	41,92
Average annual growth rate, %	38.53

Source: The author's own calculations in Excel based on the data from Research Institute of Organic Agriculture (FIBL)

The area of ecological agricultural crops certified in accordance with the requirements of internationally recognized standards has increased by 183.9 times or by 670 thousand hectares the over the period 2004-2019 with 38.5% of the average growth rate and 42 thousand hectares of the average annual absolute growth.

From 2018 to 2019, organic agricultural area in the country grew by more than 11 percent or by 67 thousand hectares.

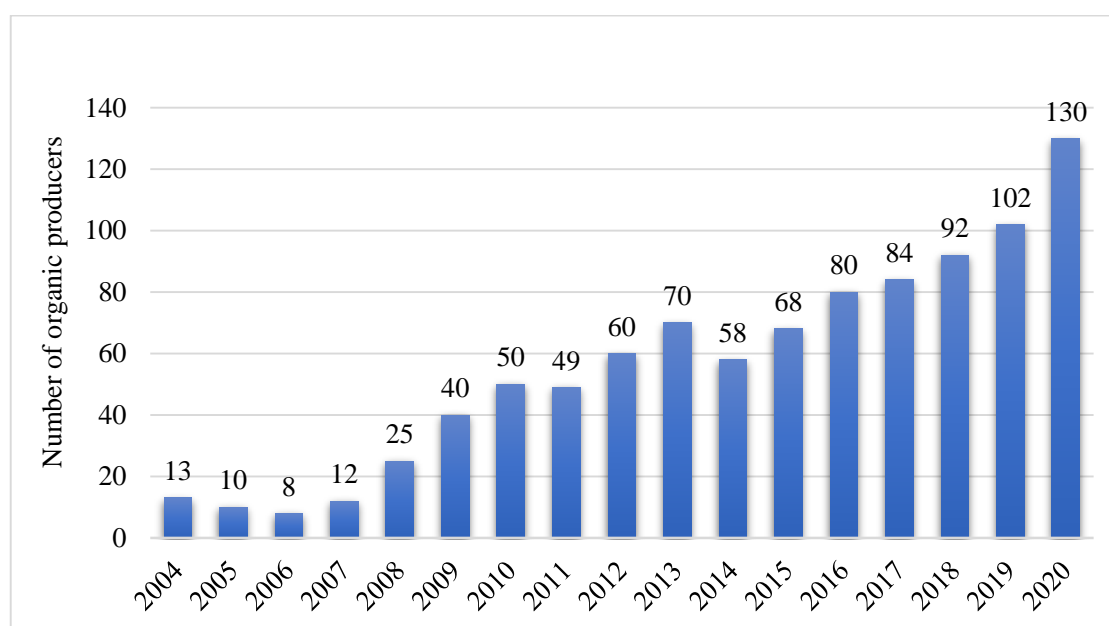
Russia has great potential for the rapid implementation of new organic land. There are more than 28 million hectares of fallow arable land.

Organic area as the main indicator of the development of the production base of organic agriculture in Russia in recent years have a clear growth trend.

#### 4.2.6 Development and the current state of the organic producers

In Russia, according to the National Organic Union of Russia, at the beginning of January 2021, there were 130 certified companies. Another 30-50 companies were at the conversion stage. 60 of them have Russian certificates, 82 international certificates (12 companies have double certification). Of these: 117 companies produce food products, raw materials and feed, 9 biological products and fertilizers, 4 are certified traders and stores. The organic segment in the Russian Federation has a high export potential, and already every 3 producers is an exporter.

Figure 16 Development of organic producers in Russia 2004-2020



Source: Compiled by the author based on the data of the National Organic Union of Russia

For estimation the direction and intensity of changes in the number of organic producers through the considering period, I compared the levels of the dynamic series and calculated the system of dynamics characteristics: absolute growth, growth rate, and growth rate in percent. (Table 20).

In addition, I calculated the average values to obtain the generalized value of the indicator for the studied period, this allows to abstract from random fluctuations (Table 21).

Table 20 Absolute growth and growth rate of organic producers in Russia 2004-2020

Year	Number of organic producers	Absolute growth (number of organic producers)		Growth rate		Growth rate (%)	
		basis	chain	basis	chain	basis	chain
2004	13	-	-	-	-	-	-
2005	10	-3	-3	0.8	0.8	-23.1	-23.1
2006	8	-5	-2	0.6	0.8	-38.5	-20.0
2007	12	-1	4	0.9	1.5	-7.7	50.0
2008	25	12	13	1.9	2.1	92.3	108.3
2009	40	27	15	3.1	1.6	207.7	60.0
2010	50	37	10	3.8	1.3	284.6	25.0
2011	49	36	-1	3.8	1.0	276.9	-2.0
2012	60	47	11	4.6	1.2	361.5	22.4
2013	70	57	10	5.4	1.2	438.5	16.7
2014	58	45	-12	4.5	0.8	346.2	-17.1
2015	68	55	10	5.2	1.2	423.1	17.2
2016	80	67	12	6.2	1.2	515.4	17.6
2017	84	71	4	6.5	1.1	546.2	5.0
2018	92	79	8	7.1	1.1	607.7	9.5
2019	102	89	10	7.8	1.1	684.6	10.9
2020	130	117	28	10.0	1.3	900.0	27.5

Source: The author's own calculations in Excel based on the data from National Organic Union of Russia

Table 21 Average values of the Organic area 2004-2020

Average values of the time series	2004-2020
Time series mean (number of organic producers)	56
Average annual absolute growth (number of organic producers)	7
Average annual growth rate (%)	14.5

Source: The author's own calculations in Excel based on the data from National Organic Union of Russia



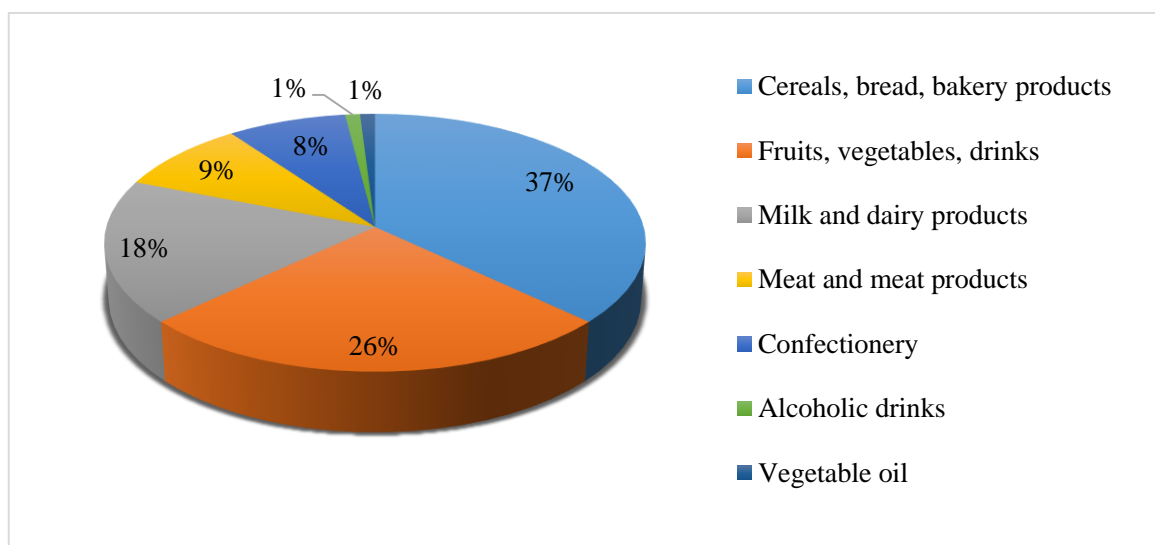
The number of organic producers for the period under review increased 10 times by 117 enterprises with an average annual absolute growth of 7 producers and an average annual growth rate of 14.5%.

The largest increase occurred in 2020 by 27.5% or by 28 manufacturers. This is due to the fact that the Russian quality system, on the recommendation of the Ministry of Agriculture of Russia, introduced free certification of organic production for medium and small agribusiness, a solution from April 20, 2020 in order to provide additional support to this segment of enterprises in the condition of the coronavirus pandemic. It also demonstrates that the support of the government's organic sector plays an essential role in its development.

But basically for considering period data show that the growth is no more than 5-10 enterprises per year. This amount is not enough to fill the market, since the consumption of organic products in Russia is growing faster than supply. Basically, this is explained by the fact that in Russia 95% of investments in this sector are private and the state is weakly involved in the development of this area of agriculture. For example, the US and Europe are huge investing in the sector and providing government subsidies to organic farmers.

At the same time, small business cannot compete with large manufacturers, provided that Russia is a member of the WTO. The production of organic products gives small businesses the opportunity to fully compete with large companies through high quality products, and not just survive.

Figure 17 Structure of organic production in Russia (%)



Source: Compiled by the author based on the data from to the National Organic Union of Russia

The Russian structure of organic production is very similar to the structure of production in European countries. In Russia, as well as there, most agricultural producers produce fruits, vegetables and cereals. This share is 63%. 18% are dairy products, and 2% are vegetable oils and alcoholic beverages, which is insignificant. (Figure 17).

The number of organic commodity producers in the period under review grew much more slowly than the area of organic agricultural land, which may indicate the consolidation of organic farms.

Most of the producers are large agricultural holdings. Formally, the average land area under 1 farm is about 6.6 thousand hectares in 2019. Despite the large areas of organic farming, organic arable land dominates in the structure of organic agricultural land use, which, according to FiBL data, in 2019 accounted for approximately 93.6% of all organic agricultural land (including land under transformation).

Russian agricultural holdings should pay more attention to the organic segment, since Russia has more than 28 million hectares of fallow land suitable for organic farming without a long (from 3 years) transition period, also there are low labor costs and high availability of inexpensive organic fertilizers, organic products have higher margin, in addition, Russia is much closer to a large sales market - the EU countries than China, which is the leader in the production of organic arable land in the world.

However, the success of the development of organic production is associated with a number of factors, such as, for example, the provision of full support from the state, including measures that do not involve direct financing, as well as the development of Russian legislation in the field of organic farming methods.

#### **4.2.7 Development and structure changes of the production base for organic crops**

In organic agriculture in Russia, most of the cultivated land is occupied by organic crops (dominated by organic wheat), which show the largest increase in absolute terms of the occupied area. In addition, during the period under consideration, there is an increase in all organic crops. Oilseeds (214 thousand hectares) also demonstrate high absolute growth, mainly due to the increase in Soybeans. (Table 22).

Table 22 Development of the production base for organic crops and its share change in the total area occupied by this crops in Russia 2011-2019

Organic crops	Organic area, hectares											Share in the total area occupied by this crop (%)		
	2011	2012	2013	2014	2015	2016	2017	2018	2019	Absolute growth (ha)	Growth rate	2011	2015	2019
Cereals, total	4772	3304	9888	10414	150271	78826	52515	119753	241130	236358	50.5	0.0114%	0.3338%	0.5419%
Wheat	2551	1351	1166	1166	140662	31148	26634	62471	125346	122795	49.1	0.0100%	0.5243%	0.4462%
Rye	264	269	237	457	286	1447		615	1155	891	4.4	0.0170%	0.0221%	0.1359%
Barley	708	479	728	728	728	6439	814	4234	12959	12251	18.3	0.0090%	0.0082%	0.1474%
Oats	152	92	733	733	733	2331	679	3091	5253	5101	34.6	0.0050%	0.0241%	0.2064%
Grain maize and corn cob mix	135	151	99	99	481	33595	22658	42268	89927	89792	666.1	0.0079%	0.0174%	3.4685%
Buckwheat	324	324	700	700	700	1030	330	2353	1568	1244	4.8	0.0357%	0.0731%	0.1932%
Rice	388	389	57	57	599	1974	1400	3647	3575	3187	9.2	0.1839%	0.2964%	1.8417%
Dry pulses and protein crops, total	218	456	850	850	1684	17166	16910	29596	58463	58245	268.2	0.0140%	0.1061%	2.7015%
Oilseeds, total	724	985	169	169	7213	112311	69376	114881	214893	214169	296.8	0.0069%	0.0626%	1.4703%
Sunflower seed	724	473	125	125	125	46892	21610	25202	65524	64800	90.5	0.0095%	0.0018%	0.7634%
Soybeans		512	40	40	7084	49335	42616	75574	100735	100735	196.7	0.0415%	2.3154%	0.0064%
Root crops, total	11	46	55	55	55	55	5982	5982	5987	5976	544.3	0.0006%	0.0035%	0.4771%
Potatoes	11	46	55	55	55	55	5982	5982	5984	5973	544.0	0.0006%	0.0035%	0.4768%
Vegetables, total	55	80	96	96	96	146			3534	3479	64.3	0.0089%	0.0170%	0.6829%
Fruit, temperate, total	1	1	30	30	30	30	20	41	20	19	20.0	0.0003%	0.0086%	0.0057%

Source: Compiled and calculated by the author based on data from Research Institute of Organic Agriculture (FiBL) and Russian Federation Federal State Statistics Service

In general, despite the high growth rates of the areas occupied by the main groups of organic crops, their relative shares are still very insignificant. Some exceptions are only organic wheat, Sunflower seed, Potatoes. But still there is a tendency for the share of Share in the total area occupied by considering crops to grow.

Based on the calculated shares for 2011 and 2019, the integral Ryabtsev coefficient was calculated to assess structural differences for the period under review.

The integral coefficient of Ryabtsev's structural differences was:

$$R_j = \sqrt{\frac{\sum(d_{2i}-d_{1i})^2}{\sum(d_{2i}+d_{1i})^2}} = \sqrt{\frac{0.22}{1.96}} = 0.335$$

Based on the scale for assessing the significance of structural differences (given in the methodological part of this work), we can conclude that there is a significant level of structural differences.

#### 4.2.8 Smoothing using moving averages and comparison of parallel time series

To identify the development trend reflecting the systematic change in the indicators under consideration over time and to exclude random fluctuations, I calculated a five-year moving average. In the table 23 presents the results of calculations of a five-year moving average for the indicators of organic retail sales, Organic farmland and Organic producers for the period 2004-2019.

Table 23 Five numbers moving averages by key indicators 2004-2019

Year number	Year	Initial data			Calculated data			
		Organic retail sales (million US\$)	Organic area (thousand ha)	Organic producers (number of producers)	five numbers moving averages			Organic area per producer (ha)
Organic retail sales (million US\$)	Organic area (thousand ha)				Organic producers (number of producers)			
1	2004	18.0	3.7	13				
2	2005	57.2	4.0	10				
3	2006	88.4	3.2	8	77	12	14	906.91
4	2007	103.2	3.8	12	92	27	19	1436.33
5	2008	115.8	47.0	25	104	35	27	1306.81
6	2009	97.7	78.4	40	114	60	35	1704.97
7	2010	116.0	44.0	50	123	89	45	1975.55
8	2011	137.0	126.8	49	133	108	54	2006.74
9	2012	147.7	146.3	60	149	141	57	2464.15
10	2013	167.0	144.3	70	161	210	61	3437.16
11	2014	175.0	245.8	58	169	247	67	3680.48
12	2015	178.0	385.1	68	178	314	72	4361.72

Year number	Year	Initial data			Calculated data			
		Organic retail sales (million US\$)	Organic area (thousand ha)	Organic producers (number of producers)	five numbers moving averages			Organic area per producer (ha)
					Organic retail sales (million US\$)	Organic area (thousand ha)	Organic producers (number of producers)	
13	2016	177.2	315.2	80	188	407	76	5321.83
14	2017	192.0	479.8	84	196	492	85	5778.09
15	2018	215.8	607.0	92				
16	2019	216.1	674.4	102				

Source: Compiled by the author based on the data from Research Institute of Organic Agriculture (FiBL) and National Organic Union of Russia

Comparison of the moving averages of organic retail sales allows me to conclude that there is a clear trend in the growth of its volume. But the growth is different - in the first five years by 12-16 million dollars, in the 6-8th year by 9-10 million dollars, then in the 9-10th year the growth amounted to 12-15 million dollars, and at the end of the studied period the growth again became \$ 8-10 million annually.

Comparison of the moving averages of organic farmland also shows a clear trend of growth in the area of organic land, but also the increments are different. In the first five years, the growth of the area was 8-15 thousand hectares, then for the 6-9th years the growth was 19-33 thousand hectares, for the 10-12th year the growth has already become 38-68 thousand hectares annually, and in recent years the growth reached 86-93 thousand hectares, which indicates a significant development of organic farmland during the period under review. Comparison of moving averages for organic producers shows that over the period under review, the growth in the number of organic producers grew steadily in general by 4-10 producers annually.

Next, it is necessary to compare these parallel time series and draw conclusions about their relationship.

Comparison of the extreme values of the series of moving averages shows that Organic retail sales increased in general by  $196 - 77 = 119$  million dollars, 2.6 times or 156%, while Organic farmland increased by  $492 - 12 = 480$  thousand hectares, in 39.9 times, as well as the Number of organic producers increased by  $85 - 14 = 72$  producers, or 6.3 times.

In addition, the average for each period was compared for the indicators of Organic farmland and Number of organic producers and a new relative indicator Organic area per producer was obtained. This indicator shows the development of the production base. The figures given in the last column of the table 23 show that Organic area per producer has

increased significantly by 4871.18 hectares or 6.4 times (7.1% in total) over 2004-2019 with an increase in the volume of organic market by 2.6 times, this became one of the main factors in the growth of production and an increase in the Russian market for organic products.

#### 4.2.9 Forecasting the development of key indicators organic farming

To assess the prospects for the development of the Russian organic sector, it is necessary to identify the main trend in the development of key indicators using the analytical smoothing method, and calculate their forecast until 2025. After analyzing the graphs and comparing the coefficient of determination and residual variance with other trend functions for the indicator organic farmlands, a linear function was chosen in the form  $y = 42.93x - 156.3$ , for the number of organic producers, the linear function  $y = 6.826x - 5.4926$  was evaluated as the best option, and finally, for organic retail sales, the linear function  $y = 11.507x + 39.822$  was chosen as well, because this functions have the most high value of the coefficient of determination and the smallest residual variance, therefore this equations better displays the values of the considering time series. The estimation of the significance of the regression equations and their parameters, based on the Student and Fisher criteria, showed that they can be used to construct a forecast.

For the indicator organic sales and organic farmland, a forecast was calculated for 2020-2025, and for the indicator number of organic producers for the period 2021-2025, since the indicator for 2020 is already known according to the National Organic Union of Russia. The results of the calculated forecasts are shown in the tables 24, 25, 26 below.

Table 24 Forecast of the organic areas in Russia for 2020-2025 (thousand ha)

Year	Forecast value	Average forecast error	Confidence interval	
2020	745.4	106.7	638.7	852.1
2021	788.3	109.3	679.0	897.7
2022	831.3	112.1	719.2	943.4
2023	874.2	115.0	759.2	989.2
2024	917.2	118.0	799.1	1035.2
2025	960.1	121.2	838.9	1081.3

Source: The author's own calculations in Excel

Thus, a forecast was obtained for organic areas in Russia till 2025 and it could be concluded that in 2025 organic farmland can reach 960.1 thousand hectares with an average error of 121.2 thousand hectares. With a confidence level of 95%, it can be guaranteed that organic lands will be no lower than 838.9 and no higher than 1081.3 thousand hectares.

Table 25 Forecast of the number of organic producers in Russia for 2021-2025

Year	Forecast value	Average forecast error	Confidence interval	
2021	145	10,31	134	155
2022	152	10,54	141	162
2023	158	10,78	148	169
2024	165	11,03	154	176
2025	172	11,29	161	183

Source: The author's own calculations in Excel

Based on the obtained results of the forecast for number of organic producers in Russia till 2025 could be concluded that in 2025 organic producers will grow to 172 with an average error of 11 producers. With the 95% probability at the significance level  $\alpha = 0.05$ ., it can be guaranteed that number of organic producers will be no lower than 161 and no higher than 183.

Table 26 Forecast of the organic products market in Russia for 2020-2025 (million US\$)

Year	Forecast value	Average forecast error	Confidence interval	
2020	281.5	16.86	264.6	298.3
2021	293.0	17.28	275.7	310.3
2022	304.5	17.72	286.8	322.2
2023	316.0	18.18	297.8	334.2
2024	327.5	18.66	308.8	346.2
2025	339.0	19.15	319.9	358.2

Source: The author's own calculations in Excel

Based on the obtained forecast for organic sales in Russia until 2025, it can be concluded that by 2025 the organic market can reach 339 million US \$ with an average error of 19 million US \$. With a 95% probability at a significance level of  $\alpha = 0.05$ , it can be guaranteed that organic retail sales will be at least 320 and not higher than 358 million US \$.

## 5 Results and Discussion

Organic production is a promising segment of the agricultural market. The production and consumption of organic products has a steady increasing trend worldwide. The leading countries in this industry include European countries, the USA, Australia and China. This direction of agriculture in Russia is at the stage of formation, but at the same time it has significant potential. Russia has a vast area of fallow land (28 million hectares), which is favorable for organic production, and in addition, the number of people who would like to buy organic products tends to grow. Thus, for the agrarian economy of Russia, organic agriculture is one of the strategic priorities.

Based on the analysis of the development of the Russian organic segment, a number of serious problems were identified that impede its rapid development. These include the need to further develop the legal framework for the organic market; expanding the forms of state support for this sector; raising public awareness of the benefits of organic products as opposed to conventional products; low level of use of information and communication technologies (ICT); insufficient amount of scientific research in the field of organic market development; insufficient number of specialized educational programs focused on training and retraining of qualified personnel for organic production.

Despite significant problems in the Russian organic market it still has a positive trend. The production of organic products is a looking forward sector for the development of agriculture in Russia. It is of great economic, social and environmental importance.

Confirmation of the formation of the organic market, aimed at the sustainable development of organic agriculture, is the entry into force of Federal Law No. 280-FL “On Organic Products and on Amendments to Certain Legislative Acts of the Russian Federation” since January 1, 2020. Currently, in order to further stimulate organic agricultural production and the organic market it is necessary to further improve the regulatory framework. It includes the adoption of normative legal acts on the implementation of the federal law “On Organic Products and on Amendments to Certain Legislative Acts of the Russian Federation”; the development of the sub-program “Development of organic agriculture” as part of the State Program for the Development of Agriculture.

Another important area of development of the organic market is the organization of effective state support for organic producers. It is necessary to support enterprises that are switching to organic production. Such support can be provided in the form of subsidies, concessional lending, tax benefits, a public procurement system, and partial cost recovery. With



the conversion of production, in other words, with the transition from classical agriculture to organic agriculture, the enterprise is in a difficult situation and in this period it is in dire need of government subsidies. In addition, government subsidies should also be aimed at training specialists in the field of certification, as well as developing training programs in the field of organic science in agricultural universities, as well as government subsidies should be aimed at retraining personnel for farmers and operating agricultural enterprises.

The introduction of tax benefits for organic producers is required, says Oleg Mironenko, head of the National Organic Union: “Now 95% of investments in organic agriculture are private; thus, tax benefits can serve as an additional incentive for further investment in the organic sector”.

The state is also required to provide administrative and marketing support at the federal level. It is necessary to increase the number of publications and stories in the media about organic agriculture. In addition, we need a strong structure that can promote the quality of organic products. For example, ROSKACHESTVO can act as a coordinating entity in the management of issues, systems of guarantees of organic quality in Russia.

An urgent direction for the development of the organic sector at the present time is the formation of a transparent certification system, optimizing the cost of this procedure for small and medium-sized enterprises. It is also important to solve the problem of certification of organic importers from abroad.

In order to maintain the competing in the organic sector, it is necessary to establish a transition period for the formation and strengthening of the Russian organic market, during which foreign certificates will be recognized. Particularly, it is possible to realize through the harmonization of standards, which will solve the problem with the recognition of certificates and establish a transition period during which to provide for the possibility of direct unilateral recognition of certificates of organic products of third countries.

For harmonization with international standards, it is necessary to establish the equivalence of the terms “organic”, “bio” and “eco”.

An important area of development of the organic market in Russia is the establishment of state statistical accounting of organic production.

The state should actively promote the attraction of new subjects to the organic market. This market is a niche for small and medium-sized businesses. It is necessary to create 5-10 thousand new producers of organic products within the next 5 years. (Union of Organic Farming, 2020)

In order to meet the demand for Russian organic products, it is necessary, according to expert estimates, to increase the number of producers by 200 annually. Without agricultural producers, it is impossible to fulfill the task of creating domestic green brands and increasing the production of organic products. (Medvedeva, 2019)

It is also important to establish new trade links with European traders. The international market needs a system for promoting Russian organic products at international exhibitions, and organizing business missions.

The possibility of increasing exports from Russia has significant potential, as many countries abroad are interested in the supply of organic products. For example, the Union of Organic Farming receives applications from international traders from the UK, France, Germany, Romania, Italy, the USA, and the Netherlands on a regular basis. Demand far exceeds supply. In the structure of demand for Russian organic products, organic fruits, vegetables, herbs, organic milk, dairy products, cheeses, and groceries are in demand.

It is necessary to increase production volumes of organic products in order to ensure availability for the Russian consumer. The growth in consumption of organic products is primarily associated with an increase in supply. At the moment, the organic market in Russia is in the process of formation and there is little competition.

In order to combat such a phenomenon as greenwashing, it is indispensably to raise awareness of costumers, as well as to establish mandatory independent certification. The adoption of the necessary legislative framework in Russia in this case will be a kind of protection for the consumer and should exclude this phenomenon from practice.

Consumers should understand what an organic production system is, how it differs from industrial agriculture, what benefits organic farming brings to the environment, the human body, the soil, and the humane treatment of animals. This requires broad information companies about organic products at the state level.

Knowledge about organic products will ensure the loyalty of consumers who provide sales, their motivation and commitment to organic agriculture, and an informed, sustainable choice of organic products.

It is necessary to develop the education and training system. To do this, it is necessary to include organic agriculture in the curricula of agricultural universities, as well as to create industrial practice courses on the basis of institutes for retraining agricultural personnel with the participation of organic producers.

The inclusion of organic agriculture in the priority areas of development of the industry will allow the budget funds allocated for agriculture to be used to support the organic sector, while no additional resources will be required.

One of the most important tasks today is to enable organic agricultural producers to make a smooth transition from traditional to organic agriculture, while promoting the development of unused land. In Russia, there is a great potential for the development of the organic market due to large areas of unused land, the presence of farms that produce environmentally friendly products, but do not have certification, etc. This can become the basis for creating new jobs with a high level of income in rural areas, a condition for the inflow of new investments for the development of rural areas and for the growth of small and medium-sized businesses in the segment of processing, logistics and trade.

## 6 Conclusion

Organic production is a dynamically developing segment of global agriculture. According to the calculations it was obtained, that from 2000 to 2019 the global market for organic products grew by more than seven times by 91 billion euros (from 15 to 106 billion euros), with an average annual absolute growth of 4562 million € and an average annual growth rate of 10.2%. The leaders in this industry are Australia, the USA, China and the EU countries. In total, at the end of 2019, 72.3 million hectares were certified and during the study period increased by 4.8 times with the average annual absolute growth of 2.8 million hectares, and the average growth rate of 8.2%. The number of producers by almost 3 million or over 12 times over the past twenty years with average annual absolute growth of 144 thousand producers and average annual growth rate of 13.4%. However, the low rate of land expansion for organic farming is one of the factors that limited market growth until the 2010s.

Organic agriculture in Russia is at the stage of formation, but at the same time it has significant potential. Russia has a vast area of fallow land (28 million hectares), which is favorable for organic production, and in addition, the number of people who would like to buy organic products tends to grow. Thus, for the agrarian economy of Russia, organic agriculture is one of the strategic priorities.

The Russian organic market has been growing rapidly since 2004 till 2019, increasing by more than 12 times to 216 million dollars with average absolute growth of 12.4 million US\$. The average growth rate is 16.8% per year for the considering period. Therefore, the organic market in Russia grew by 1.8 times faster than the global organic market (10.2%). The organic farmland has increased by 670 thousand hectares the over the period 2004-2019 with 38.5% of the average growth rate and 42 thousand hectares of the average absolute growth. The number of organic producers for the period under review increased 10 times by 117 enterprises with an average annual absolute growth of 7 producers and an average annual growth rate of 14.5%.

For estimation the prospects of the development of the organic sector in Russia, using the method of analytical smoothing, the main trend in the development of key indicators was identified and their forecast was calculated until 2025. Therefore, it could be concluded that by 2025 with a confidence level of 95%, organic farmland can reach 960 thousand hectares, the number of producers can grow to 172 producers, and the organic market can reach over 339 million US.

But despite good growth indicators and the obvious progress, the market is at the initial stage of formation, Russia lags behind the world's leading economies in most basic indicators

Based on the analysis of the development of the Russian organic segment, a number of serious problems were identified that impede its rapid development. These include the need to further develop the legal framework for the organic market; expanding the forms of state support for this sector; raising public awareness of the benefits of organic products as opposed to conventional products; low level of use of information and communication technologies (ICT); insufficient amount of scientific research in the field of organic market development; insufficient number of specialized educational programs focused on training and retraining of qualified personnel for organic production.

At present, in the context of the accelerated development of the world market for organic products, there is a need for the development and implementation of specific steps of state policy that contribute to bringing the domestic market to a sustainable development trajectory. They can be formulated as follows: further improvement of the regulatory framework; the organization of effective state support for producers of "organic" and the introduction of tax incentives for them; an increase in the number of publications in the media about organic farming; creation of a structure that promotes the quality of organic products and the formation of a transparent certification system; the establishment of new trade relations in international markets and an increase in the export of organic products from Russia; inclusion of organic agriculture in the educational programs of agricultural universities; training of personnel for work in the field of "organic"; implementation of a planned transition from traditional agriculture to organic.

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