

## Article

# Rental Income Structure in Economy as a Basis for Sustainable Agrarian Relations in the Agro-Industrial Complex

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Received: 16 July 2020; Accepted: 3 September 2020; Published: 5 September 2020



**Abstract:** Modern features of the development of the agro-industrial complex as part of the economy as a whole require changes in the traditional models of state regulation, which do not take into account the structure of rental income in the economy and do not use the capabilities of the relevant instruments. This is reflected in the insufficient efficiency of subsidies provided by the state to agricultural enterprises and the preservation of high social and infrastructural differentiation of the regions, as well as the dependence of the agricultural sector on the pricing policy of other industries. All this is shown by the example of the analysis of statistical data of regions of the Russian Federation for 2011–2019. To eliminate these problems, theoretical and methodological approaches have been developed, which made it possible to substantiate the concept of regulating the sustainability of agricultural relations through the synthesis of the theory of sustainability, the theory of systems, and rental theory. Within the concept the role of the structure of rental income in the formation of sustainability of agrarian relations, in their qualitative content, and in the redistribution of added value from the agrarian sphere in monopolized spheres is revealed. The possibility and necessity of state regulation of the agrarian sphere on the basis of dynamic regulation of the sustainability of agrarian relations with the help of management of the rent mechanism is substantiated.

**Keywords:** rental income structure; agrarian relations; economic sustainability; state regulation; rent mechanism; normative and dynamic approach; rent profile; subsidizing and taxation of agricultural enterprises

## 1. Introduction

Sustainability of economic relations in the agrarian sector is believed to have a strong positive effect on future global economic growth, especially under the conditions of increasing population and limited natural resources. Food security, which greatly depends on the dynamics of the agro-industrial complex, will be of utmost importance [1–4].

Under such circumstances, traditional market relations and state regulation models will not be able to ensure long-term conditions for the well-balanced development of economy, society, and nature. This can be exemplified in the capital-oriented allocation of state funds within the agrarian sector of the Russian Federation, which fails to consider the current situation regarding the generation and distribution of rental income among participants of agrarian relations. Therefore, firstly, there is a disproportional increase in financing major agrarian enterprises, which already receive a significant share of first differential land rent and monopoly land rent, and secondly, there is a depreciation of the capital of agrarian businesses operating without the rent condition, and under-financing of agrarian investment-intensive sub-industries as a whole.

Moreover, allocation of state funds in the Russian Federation does not consider the increased dynamics in rental income flows in the agro-industrial complex in particular and in the economy in general, which leads to large income gaps between participants of agrarian relations. The recent agrarian growth in the Russian Federation has been accompanied by intensified monopolization and a reduced number of economic stimuli aimed at preserving and enhancing the quality of domestic products. As a result, there has been a disruption of the enhancement of the sustainable agrarian relation, which stimulates relocation of capital flows from the industrial sector of the agro-industrial complex into the financial sphere, therefore disturbing investment and innovation development strategies within the industry and environmental development, and damaging the structure of agrarian relations leading to more businesses producing products with a higher margin.

At the same time, increased exploitation of natural resources and stronger dynamics of economic and political situations have resulted in considerable changes and fluctuations in the rental income structure, including the emergence of new types thereof. Therefore, it is crucial to study the process of rent formation, define and describe the rental income structure over time, and determine regulatory mechanisms aimed at reducing negative effects emerging in the rent-seeking behavior of economic agents.

Market relations are one of the most important accomplishment of the human civilization. However, there is still an unsolved dispute in economics regarding the role of the state in economic management and to what extent it can control the economy. This uncertainty is also reflected in the dynamics of the economy, as liberal trends and protectionist tendencies interchanged throughout history [5].

The analysis of two opposite state regulation policies—a centrally planned economy and an open market—has shown the necessity of a completely new regulatory system. In this regard, it should be mentioned that Herbert Spencer and many other prominent economists [6–8] believed the role of state was to create and maintain equal opportunities for all.

However, two questions need to be raised:

1. Has any state created truly equal competitive conditions and used correct tools to maintain them during the liberal economic stage?
2. Should opportunities be non-differentiated for every economic agent (at least in theory)? If not, to what extent should they be differentiated?

When answering these questions, it makes sense that such a level of qualitative and quantitative differentiation should be proposed that, on the one hand, can secure economic growth, and on the other hand, can guarantee a balanced economic system and its stable development [9].

In the agrarian economy of the Russian Federation, rent-related economic regulations are established in accordance with highly prioritized differentiation and monopolization. Thus, in order to localize rental income in the industrial sector of the agro-industrial complex, promote competition, improve the pace of its growth and encourage more resources into production, a flexible system of rental regulators is required that would ensure a long-term balance between production and social and financial factors in a process of generation, distribution, and re-distribution of agrarian rental income.

Therefore, the purpose of this study was set as the development of theoretical, methodological provisions that determine the necessity and the possibility of forming a concept for rent regulation of the sustainability of agrarian relations at the state level. First of all, the role of rental categories in the establishment of agrarian relations and their sustainability should be studied, changes in understanding of the notion of rental income should be explained, and new methods of rent-centered state regulation in the agrarian sector should be introduced.

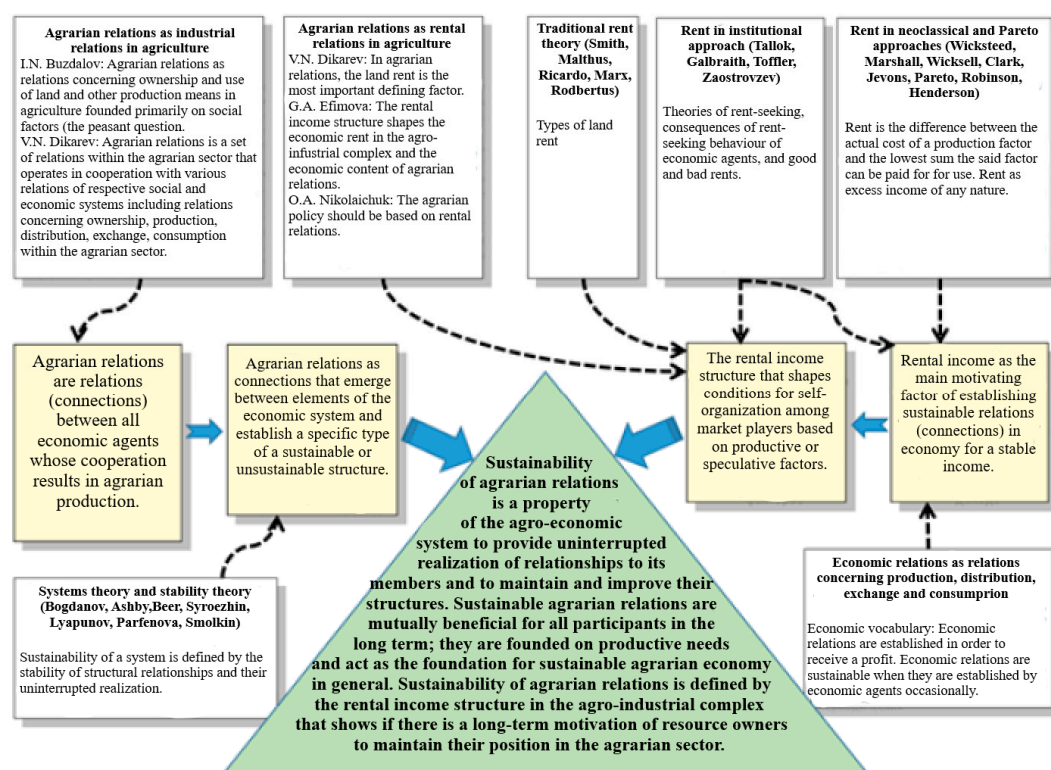
## 2. Materials and Methods

### 2.1. Dialectics of Sustainability of Agrarian Relations

Among economic relations in various sectors, agricultural ones, of course, have every right to be considered the most important, determining the satisfaction of basic priority human needs. However, there is no unified approach to their understanding. Thus, many economists have their own definition of agrarian relations: some describe them as industrial relations in agriculture [10–12]; some define them as economic relations emerging in agrarian production due to land ownership and its utilization (or the so-called economic and legal aspect of land relations [13]); others propose a rental approach, which is based on contemporary beliefs that agrarian relations are founded on rental relations in the agro-industrial complex [14,15].

Other works [16,17] depict agrarian and land relations as a set of relations that operate in cooperation with various elements of respective regional and global social and economic systems. An additional work [18] also highlights significant connection between the rent theory and the theory of sustainable development.

Therefore, based on the theories by Buzdalov and Dikarev, agrarian relations can be described in the most general terms as economic relations (or connections) that involve all economic agents, whose collaborative activities result in agricultural production. Figure 1 illustrates this statement.



**Figure 1.** Theoretical foundations and definition of sustainability of agrarian relations. Source: developed by the author.

At the same time, however, according to the systems theory and the sustainability theory, the sustainability of a system is defined by the sustainability of structural relationships and their uninterrupted realization [16,19–21]. Therefore, the whole mechanism of agrarian relations can be presented in the form of relationships that come together in a stable or unstable system.

Many authors emphasize the role of rental categories in understanding the essence of agrarian relations. Thus, the following work [15] states that the rental income structure determines the economy of agrarian relations. The work [16] defines land rent as a factor for a system of agrarian relations.

Therefore, it is necessary to specify the essence and structure of rental income in the agro-industrial complex, as the process of generation, distribution and re-distribution of rental income within economic systems determines their sustainability. Thus, the right side of Figure 1 shows various approaches to the rental income concept to help specify the role of rental categories in establishing agrarian relations and ensuring their sustainability.

The neoclassical approach [22] presents rent as a source of excess profit from any factor of production. The institutional approach [23–25] distinguishes between good or bad rents, while the traditional rent theory [26–28] classifies types of agrarian rent in particular. The definition of rental income as excess income that does not require significant labor effort to earn given by the following work [2] is the closest to the one used in the present work.

To sum up, rental income can be described as the main motivating factor for establishing sustainable relations in the economy with the end goal of making a stable profit. In addition, the chosen structure of rental income is said to be simultaneously an indicator of and a condition for the self-organization of market players on the basis of productive or speculative factors.

Thus, the term sustainability of agrarian relations can be logically defined as a property of agro-economic systems that provides uninterrupted realization of relationships to its members and to maintain and improve their structures. Uninterrupted realization of relationships has a much deeper meaning than just a possibility to promptly realize a personal right according to an established contract between two economic agents. Besides that, it is also a capability to promptly find an adequate contracting partner at a reasonable cost and with predictable quality of a good or service. Such a relationship must be advantageous for both parties, and meso and macro sustainability levels of an economic system must be high enough not to allow for a macro-environment to change and hinder the realization of a contract. The efficiency of a relationship can be defined via the efficiency of contractual relationships established in order to satisfy economic interests of their participants [29].

The key factor, and, consequently, the criterion for the sustainability of agricultural relations, will be the structure of rental income in the agro-industrial complex. Sustainable agricultural relations are mutually beneficial for their participants in the long term, and express the presence of long-term production (not speculative) motives of resource owners to maintain their application in the agricultural sector [30].

In turn, the structure of rental income with a predominance of production motives will have a significant impact on the sustainability of social and agrobiological subsystems. After all, the essence and mechanism of agrarian relations stem from their interaction at the basic level with the economic subsystem. At the economic level, agrarian relations contain the relations of production, exchange, distribution, consumption, and reproduction. At the same time, land relations, as relations associated with land ownership, which are part of agrarian relations, are in many respects fundamental, since the forms of realization of property rights have a significant impact on the form and content of agrarian relations through the rent mechanism.

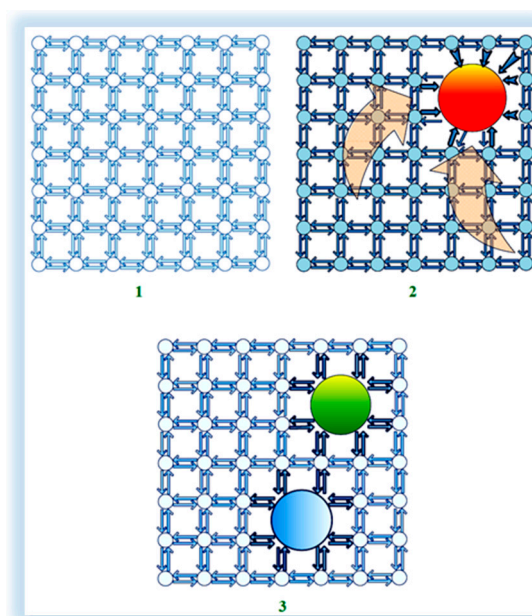
On the other hand, it is the land issue that also largely determines the form of existence and the quality of life of society, that is, it determines the social aspect. In addition, land is a means and an object of labor in agriculture, the basis of ecosystems—after all, the basis of agricultural production is the interaction of land and labor, which were called by Petty the mother and father of wealth. With the development of the economy, an increase in population, and the aggravation of problems with limited resources, the value and importance of land gradually increase, the rate of involvement of land and other resources in the market circulation and the reproduction process increases, and the real value of products produced using limited land resources increases. Accordingly, the role of land and land rent in the value of social production increases. As a result, rent occupies a central place in agrarian and land relations, since it affects all processes, connections and elements of agrosystems, acting as the main system-forming and self-organizing factor, forming the structure and content, as well as the dialectics of the sustainability of agrarian relations. A sustainable agricultural relationship becomes mutually

beneficial for all participants in the long term and indicates a long-term productive (or non-speculative) motivation of resource owners to maintain their use in the agricultural sector.

Many authors highlight the necessity to establish productive relationships in the economy [31–34]. In the event of an extended disturbance of the rental income structure with a prevalence of non-productive monopolistic forms of rental income, a self-sustaining process of establishing and encouraging institutional norms of economy operation emerges that is founded on negative types of rent-seeking behavior. This results in social stratification and excessive differentiation of growth in all economic sectors [35,36]. The following works [37–39] proved that a high level of differentiation is a disincentive in innovation and technological development.

Figure 2 illustrates the above statement with three types of perfect economic relationship structures, depicting the role of the volume and structure of rental income in sustainability of economic relations. In particular, they are:

1. A homogeneous structure that is in correlation with market conditions of perfect competition with no differentiation in operation conditions among economic agents; there is no rental income (unsustainable) as there is no long-term motivation to maintain relations without excess income. Market players are likely to look for other opportunities to invest their capital.
2. Asymmetric structure with induced monopoly as the center of value absorption (quite sustainable). This relationship structure is sustainable as long as elements around the center of value absorption remain active; however, it breaks apart when there is nothing else for the center of value absorption to take or when donor agents try to change the situation.
3. Asymmetric structure with know-how centers of value generation (sustainable). The structure is sustainable in the long term provided there are no obstacles for creation of new centers of value generation and there is institutional control over attempts to turn centers of value generation into centers of value absorption, or over induced monopoly. It is also crucial that market players with a stronger market position do not abuse it, as described in [40].



**Figure 2.** Three types of perfect economic relationship structures. Source: developed by the author.

In simpler terms, a homogeneous economy is a grey and dull world that does not allow for any opportunities to conclude a contract and contemplate its conditions but allows for an instant establishment of relationships that are not valued by contracting agents as they are not unique and do



not help them make excess income in the form of rent. In other words, the amount of received rental income defines the sustainability of economic relationships.

In monopolistic economies, a great number of economic agents form their relationships not by choice but under coercion as there are artificial obstacles prohibiting other ways of establishing economic relationships. In economies with an efficient structure of rental income with centers of value generation, there are many relationships, hence there are much more opportunities to access unique products and special technologies. Therefore, these relationships result in mutually beneficial long-term economic relations.

It is possible to establish sustainable economic relations built on mainly productive factors and aimed at gaining excess income generated via innovations, provided the rental income structure is institutionally regulated on the basis of finding a balance between providing an unobstructed possibility to realize a relationship and ensuring its value for both parties. In particular, the work [41] lists various factors for enhancing the role of intellectual and innovative rents in the context of sustainable development of the agrarian sector of economy.

However, the whole essence of agrarian relations eliminates the speculative part. Sustainability of agrarian relations is possible only through self-organization of market players on the basis of making productive rental income. The rental income structure will have a cumulative impact on the sustainability of agrarian relations and stimulate either their rapid productive growth or degradation and establishment of speculative economic relationships. At the same time, in the long term, such productive growth will be possible only in the case of a balanced development of the social and ecological subsystem.

## 2.2. Rent-Based Approaches to Regulating Sustainability of Agrarian Relations

The theoretical approach and terminology presented in the paper are to be applied in practice. In particular, a multidimensional nature of agrarian relations can be easily described with the language of system analysis, thereby making it possible to formalize the regulatory process of their sustainability in order to create fundamental conditions for a stable growth of efficient production in the agro-industrial complex.

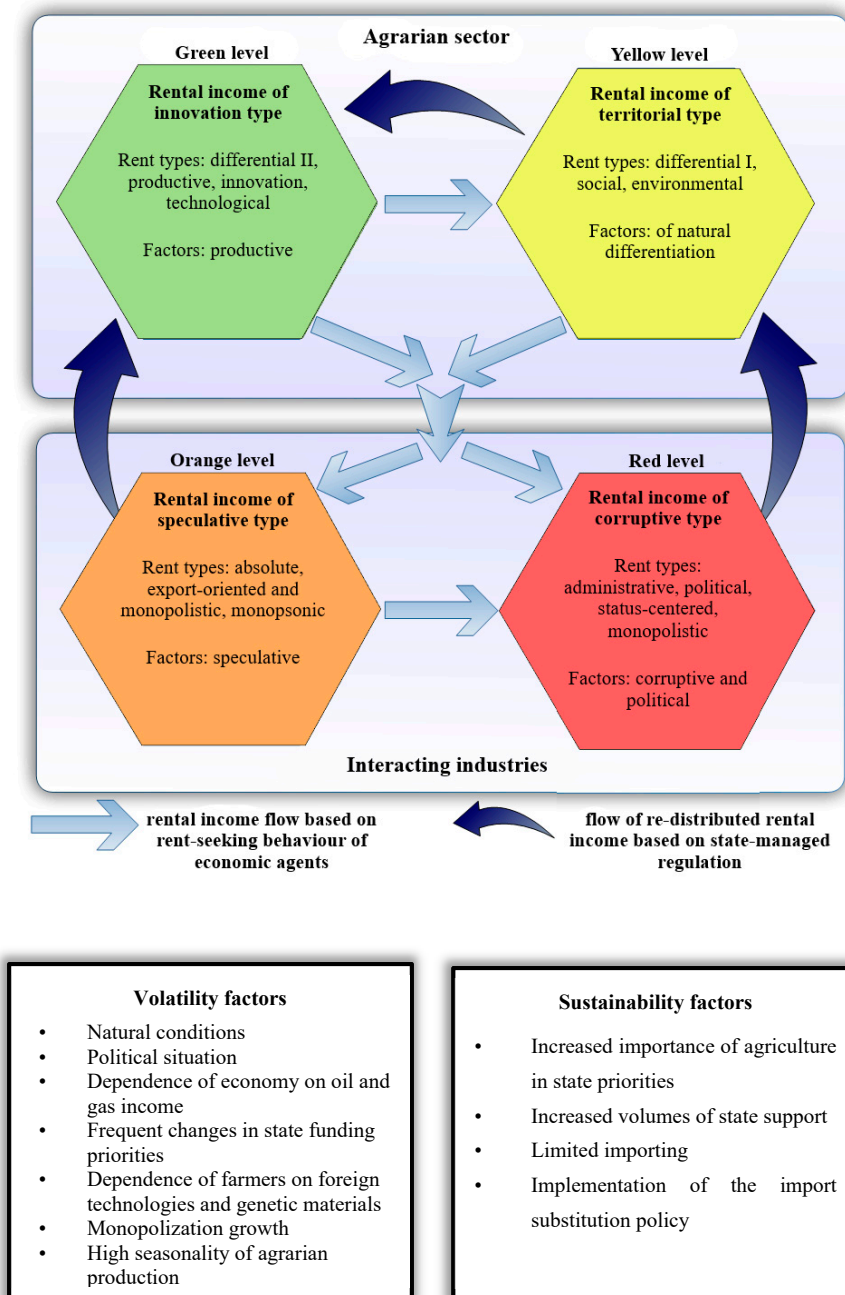
In the context of efficient regulation of the agrarian sector, it is important to perceive sustainable agrarian relationships as the structural foundation for the sustainability of agrarian economy in general. This can be done through imposing the necessary agrarian rental income structure that would encourage productive and not speculative activities in the agro-industrial complex, via state regulation.

Figure 3 shows the rental income flow in the agro-industrial complex and factors affecting the flow. It also classifies rental income types with the greatest impact on sustainability of agrarian relations. The types are presented in the form of a colored differentiated scale depicting various qualitative features of the said impact (the red color means stronger and more destructive types of rental income, while the green color denotes the only rental income types that have a positive impact on the economy).

The green level includes rents that increase the sustainability of agricultural relations. This is rent, the formation of which is due to the different efficiency of capital (economic, intellectual, technological) application to the resource. These rents increase the sustainability of enterprises, increasing the output per unit of resource, and stimulates the development of agriculture, but only if the rents belonging to another level of influence (yellow, orange, and red levels) are leveled.

The second level (yellow) reflects rent that has a negative impact on the sustainability of agricultural relations and is associated with the differentiation of the quality or quantity of the resource involved in production (differential rent I, social, environmental rent). These rents are objective and contribute to an increase in the socio-economic and environmental differentiation of regions, oblasts, and economic agents.

The third level (orange) includes rents that have a significant negative impact on the sustainability of agricultural relations. These are the rents associated with the power of monopoly in the market: natural and economically viable monopolies.



**Figure 3.** Rent mechanism of sustainability of agrarian relations in dynamics. Source: developed by the author.

The fourth level (red) includes rental income, the formation of which is most undesirable, since it can bring the greatest harm to the development of social, environmental, and economic relations. These are rents associated with administrative, political, and status power, which give rise to the formation of artificial monopolies, which are economically inexpedient and supported only by the pursuit of rent by economic agents.

It should be noted that the rent mechanism is implemented through the deviation of prices from the actual value, according to the principle of substitution, leading to the replacement of production factors by speculative ones in the development of both agriculture and other industries. In this case, some types of rent are also replaced by others. Hence, monopoly and absolute rent in the process of movement of rental income tend to absorb all forms of differential land rent.

In turn, the formation of differential rent I from landowners does not stimulate the intensification of production and prudent use of resources, but leads to absorption through the pricing mechanism of differential rent II formed in other farms on lands of lower quality. Thus, in the process of the movement of rental income, it is very important to analyze the formed rental proportions and trends in their change.

At the green and yellow levels, the rent mechanism operates on the basis of differentiation of intra-industrial conditions of the agrarian sector; at the red and orange levels, it operates on the basis of differentiation of inter-industrial conditions. Currently, the effect of green-level productive rental stimuli in Russia is limited due to high volatility of rental proportions (Figure 3 also demonstrates the current volatility and sustainability factors), in which frequent changes do not encourage investments into the agrarian sector.

In order to establish sustainable agrarian relations, it is also vital that every fluctuation in rental proportions is automatically balanced out by an opposite fluctuation enforced by state regulation to maintain the rental balance in the agrarian sector. It is rather relevant today as well, as current state-created sustainability factors (presented in Figure 3) fail to completely balance out volatility factors, hence creating fluctuation amplitudes leading to degradation of agrarian relations.

Sustainability of agrarian relations must be regulated on the basis of cumulative processes associated with the establishment of internal prerequisites aimed at the efficient application of internal capabilities for further growth and sustainability enhancement. In this case, even a weak growth and sustainability-related potential of many agrarian businesses can be hugely strengthened. It only requires dynamic alignment between rental factors with a cumulative nature of influence. In other words, it requires rational changes made in the rental income structure over time on the basis of state regulation aimed at establishing those rental income types that are prioritized for their positive impact on sustainability of agrarian relations.

On the example of the EU, one can note the problems associated with subsidizing agricultural enterprises within the framework of a common agricultural policy. Larger farms have benefited the most over smaller farms [42]. This, in turn, excessively increased the level of social differentiation in rural areas. At the same time, the author of [43] shows in his paper that subsidies to farms located in less favorable areas do not sufficiently increase the efficiency of agricultural production.

Such problems are due to the fact that the allocation of subsidies does not fully take into account the actual structure of rental income of agricultural enterprises. Larger farms, in accordance with the positive effect of the scale of production, already partially receive monopoly rent. The allocation of subsidies to farms in disadvantaged areas does not take into account the actual differential rent II formed in these farms. In this context, it would be more correct to dynamically adjust subsidies based on an assessment of the effectiveness of the use of available rental resources by each agricultural enterprise. In the first case, the size of the subsidy should be adjusted downward; in the second case, it should be adjusted upward.

However, as it is impossible to create such conditions that would completely eliminate the chances of rental income of the yellow, orange, and red levels in practice, it is crucial to aim at those rental proportions that ensure that the rental income increasing sustainability of agrarian relations is higher than the rental income decreasing it. In other words, it is important to keep dynamic rational rental proportions.

Moreover, constant fluctuations in the rental income structure also require formalization of dynamic criteria due to the fact that it is the dynamics of the rental income structure that will have the strongest impact on sustainability of agrarian relations, not its total volumes. For instance, the efficiency of productive rental stimuli of the green level is currently limited due to a high volatility of rental proportions. As they frequently change, it discourages attraction of investments into the agrarian sector.

In order to form the main target function, it is necessary to use the synthesis of the classical and institutional approaches as part of the rental theory, as well as to turn to the general principles of



constructing normative-dynamic models in the theory of economic systems, the founder of which is Syroyezhin [44]. This approach can be used to perform dynamic calculations on ordinary scales [45].

Hence, the theoretical basis for the impact that rental income has on sustainability of agrarian relations presented above resulted in such a target function (rental profile) in the form of a mathematical expression for the dynamic harmonization of rental factors. A growth rate of rental income with a stronger negative impact on sustainability of agrarian relations should be lower than a growth rate of rental income with a weaker negative impact. A growth rate of rental income with a positive impact should be higher than growth rates of other forms of rental income.

Maintaining correct ratios between growth rates within the rental profile will result in perfect growth conditions for the generation and further accumulation of productive rents in the agrarian sector. In turn, this will encourage more reproduction processes in the agro-industrial complex on a much wider basis.

$$K_4 < K_3 < K_2 < K_1 \quad (1)$$

where  $K_1$  is the growth rate of green level income;  $K_2$  is the growth rate of yellow level income;  $K_3$  is the growth rate of orange level income; and  $K_4$  is the growth rate of red level income.

The resulting target function is also consistent with the general methodological approaches to state regulation in the agro-industrial complex.

### 3. Results

First of all, it is necessary to identify the main reasons for disturbances in the operation of the rental mechanism that impede the achievement of the sustainability of agricultural relations in the Russian Federation.

This can also be seen in an illustrative example. The correlation dependence between indicators of the development of agricultural production in the large regions of the Russian Federation for 2011–2019 was investigated alongside key indicators reflecting the actions of the rental mechanism. The results are presented in Table 1, which displays the final correlation coefficients between indicators by rows and by columns. Calculations were based on data from Rosstat RF [46]. The total sample size was 380 units. For a significance level of 0.05 and a given number of measurements, the tabular critical value of the correlation coefficient was 0.105. Thus, in all cases, the calculated value of the coefficient was greater than its critical value. That is, the hypothesis of the significance of the linear relationship was not rejected.

For example, price disparity and high volatility in conditions of insufficient antimonopoly regulation and government support cause a high differential of the red and orange rental mechanisms. This is confirmed by the revealed inverse correlation between the prices of basic resources for the agricultural sector and the profitability of sales in agricultural production, as well as the growth rate of production volumes, which prevents the formation of stable economic relations between agricultural enterprises and suppliers of resources and buyers of agricultural products.

The high differentiation of natural and economic conditions, a significant gap in the quality of infrastructure between the city and the countryside, and insufficient linking of state subsidies to the efficient use of production factors determine the action of the yellow level rental mechanism. This was confirmed by a weak negative correlation (the correlation coefficient is  $-0.393$ ) between the share of wages and salaries per one employee of an agricultural enterprise in the proceeds from the sale of agricultural products, also per one employee, and the growth rate of production volumes. In combination with the high gap between wages in agriculture and the economy as a whole and infrastructure problems in the countryside, there are serious obstacles to the formation of sustainable labor relations in the agricultural sector.

It is also important to note the insufficient efficiency of the use of land resources, due to the operation of the yellow level rental mechanism. This revealed a significant correlation ( $0.507$ ) between the cadastral value of land in the constituent entities of the Russian Federation and the level of profitability of agricultural production. This indicates a significant differentiation of the starting

conditions for farming in the agricultural sector, which largely depend on the region and its location. At the same time, there was no significant correlation between the cadastral value of land in the regions and the growth rate of production volumes.

In addition, the intensification of production does not always lead to a proportional increase in the profitability of business in the agricultural sector, which is due to the weakness of the differential of the green level rental mechanism in the context of a significant share of incomes of the yellow, red, and orange levels.

**Table 1.** Justification of violations in the operation of the rental mechanism.

Disturbances in the Operation of the Rental Mechanism	Reasons for Disturbances	Empirical Evidence		
		Correlated Indicators		Correl. Coeff.
1. High differential rent mechanism at the red and orange levels, which prevents the formation of sustainable economic relations of agricultural enterprises with suppliers of resources and buyers of agricultural products.	Price disparity and high volatility in the context of insufficient antitrust regulation and government support aimed at supporting large enterprises.	Fertilizer prices	Profitability of sales of agricultural production	−0.289
		Diesel fuel prices		−0.651
		Electricity prices		−0.485
2. High differential of the rent mechanism at the yellow level causes insufficient efficiency in the use of land resources, as well as obstacles to the formation of sustainable labor relations in the agricultural sector.	There is a high differentiation of natural and economic conditions, a gap in the quality of infrastructure between cities and villages, and insufficient consideration of regional production characteristics in state regulation.	Average specific cadastral value of land	Profitability of sales of agricultural production	0.507
			Growth rate of agricultural production	0.290
		The share of expenses on wages per employee in the proceeds from the sale of agricultural products	Growth rate of agricultural production	−0.393
3. Weak differential of the green-level rent mechanism in the conditions of a significant share of income at the yellow, red, and orange levels causes insufficient sustainability of relations between the owners of capital goods, as well as entrepreneurial resources, and the agricultural sector.	The intensification of production does not lead to a proportional increase in business profitability in the agricultural sector.	Milk yield per cow	Return on sales of agricultural production	0.301
			Growth rate of production volumes of milk	−0.211
4. Current state regulatory measures do not sufficiently eliminate the withdrawal of rental income from the agricultural sector, as well as the high volatility of rental proportions.	There is no binding of state regulation measures to the rental mechanism.	The amount of subsidies in the regions of the Russian Federation for 1 million rubles of products	Growth rate of agricultural production	0.121
		Growth rate of subsidies		−0.335

In dairy cattle breeding, the correlation between the level of milk yield per cow and the profitability of sales was 0.301, and between the level of milk yield per cow and the rate of production growth it was negative, at −0.211. All this indicates the insufficient sustainability of economic relations between the owners of capital goods, as well as entrepreneurial resources and the agrarian sphere.

At the same time, the current measures of state regulation do not completely eliminate the departure of rental income from the agricultural sector, as well as the high volatility of rental proportions. This was confirmed by the fact that in the course of the study it was not possible to deduce a significant relationship (the correlation coefficient was 0.121) between the amount of subsidies in the regions of the Russian Federation per 1 million rubles' worth of products and the growth rate of its production. At the same time, a weak negative correlation (coefficient was equal to −0.211) between the growth rate of subsidies and the growth of agricultural production was determined.

In addition, there is an insufficiently effective distribution of available state support funds, which is expressed in instability, delay in receiving, and dependence on the success of the region as a whole. As a result, this reduces the investment attractiveness of the dairy farming industry.

Violations in the operation of the rental mechanism also led to the fact that in the 1990s, the agrarian sphere of the Russian Federation faced a significant withdrawal of investments into speculative economic relations not related to agricultural production.

However, the results of the recovery phase of the development of agrarian relations since the year 2000 to this day are still far from the needs of society for affordable and high-quality food. The sustainability of agricultural relations is currently based on the production of more marginal products at the expense of the quality and variety of food products, as well as on an increase in the level of monopolization in the agro-industrial complex.

Hence, in the Table 2, taking into account the volume of palm oil use in the food industry as a substitute for milk fat, the approximate amount of the information asymmetry rent received by producers of surrogates at the expense of consumers is calculated, and, accordingly, agricultural producers of whole milk lose. Information asymmetry rent is calculated as the product of the volume of milk fat replaced and the difference between the price of 1 ton of milk fat and the price of 1 ton of palm oil. This table illustrates not only the preservation, but the intensification of the problems with the quality of the final product. Calculations were based on data from Rosstat RF [46].

**Table 2.** Illustrative calculation of the rent of information asymmetry in dairy production for 2015–2019.

Indicators	2015	2016	2017	2018	2019
1. Price for 1 ton of milk fat, \$	3294	3718	4503	4621	4510
2. Import of palm oil to the Russian Federation, thousand tons	889	885	892	1060	1061
3. Amount of palm oil that went to replace milk fat, thousand tons	644	641	637	747	768
4. Price for 1 ton of palm oil, \$	722	731	787	706	630
5. Palm oil imports, million \$	642	647	702	749	668
6. Equivalent amount of unused milk, thousand tons	16,947	16,872	16,760	19,649	20,223
7. Information asymmetry rent, million \$	1656	1915	2366	2923	2982

Table 3 shows the dynamics in crop production for 1990–2019. Calculations were based on data from Rosstat et al. [46]. As can be seen from the table, the rental mechanism significantly changed the structure of production in comparison with 1990. The growth affected only relatively marginal crops, such as wheat or sunflower. The production of oats, rye, millet of other minority crops not only did not recover in relation to 1990, but for some of them also decreased in relation to 2000. First of all, this concerns rye as a very cultured, less nutritious, but more fortified grain, allowing to diversify the diet. This is partly due to a decrease in demand, but in the Russian Federation the production of this crop has fallen much more than in other large agricultural countries.

These problems are only “the tip of the iceberg” and require deeper empirical research based on an analysis of the structure of rental income and its dynamics. At the same time, the further development of agricultural relations is seen through the improvement of relations between the state and agricultural enterprises. It is necessary to direct measures of influence to eliminate violations in the operation of the rental mechanism, which is the main motivating factor for building stable agricultural relations.

Sustainability of agrarian relations must be first and foremost regulated on the basis of a system of objectives set according to long-term goals, monitoring of current problems and realistic possibilities of implementing various regulatory methods. This paper presents a four-stage regulatory model of sustainability of agrarian relations based on a rent mechanism (shown in Figure 4):

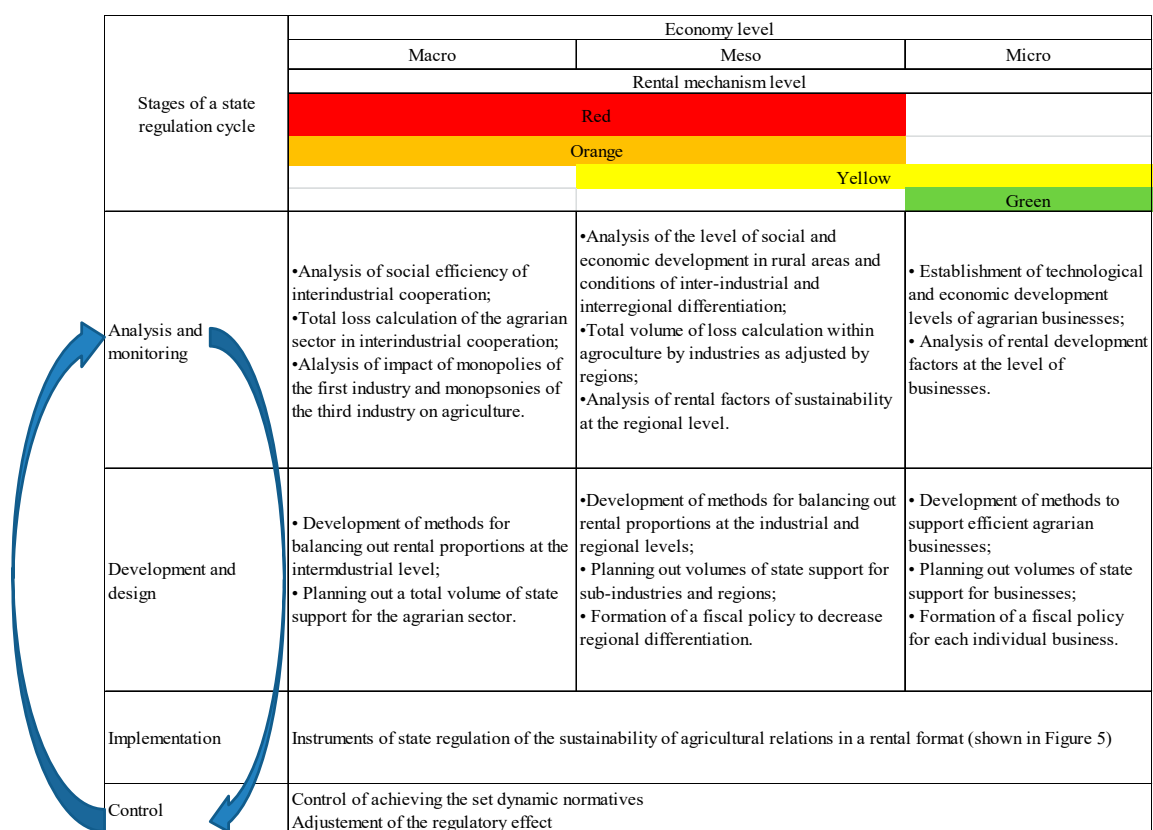
- (1) Analysis of sustainability of agrarian relations in the form of an analysis of current rental proportions and classification of issues by priority;
- (2) Establishment of methods of balancing out rental proportions in accordance with their potential efficiency;
- (3) Implementation of methods of balancing out rental proportions in accordance with their impact level;

- (4) Constant monitoring and adjustment of current rental proportions; if necessary, repetition of stages 1, 2, or 3.

**Table 3.** Dynamics in crop production for 1990–2019, in thousand tons.

Crop Products	Years							
	1990	2000	2005	2010	2015	2019	2019 for 1990	2019 for 2000
Buckwheat	8.09	9.97	6.05	3.39	8.61	7.86	0.97	0.79
Cereals and legumes	1166.76	654.2	778.03	609.6	1047.29	1212.00	1.04	1.85
Potatoes	308.48	294.65	281.37	211.41	254.06	220.75	0.72	0.75
Fodder root crops	172.17	30.79	15.2	9.02	6.57	4.47	0.03	0.15
Corn for grain	24.51	14.89	30.6	30.84	131.38	131.38	5.36	8.82
Corn for silage, green forage and haylage	1890.18	507.08	253.93	128.11	283.43	271.85	0.14	0.54
Oilseeds	46.62	44.73	75.57	74.57	147.96	243.22	5.22	5.44
Oats	123.26	60.02	45.45	32.2	45.38	44.24	0.36	0.74
Open and protected ground vegetables	103.28	108.22	113.48	121.26	131.85	141.05	1.37	1.30
Millet	19.46	11.24	4.55	1.34	5.72	4.40	0.23	0.39
Winter and spring wheat	495.96	344.6	476.15	415.08	618.11	744.53	1.50	2.16
Rice	8.96	5.84	5.71	10.61	11.10	10.99	1.23	1.88
Winter and spring rye	164.31	54.44	36.22	16.36	20.88	14.28	0.09	0.26
Sugar beet	323.27	140.51	212.76	222.56	389.89	543.50	1.68	3.87
Winter and spring barley	272.35	140.39	156.84	83.5	174.99	204.89	0.75	1.46

Note: The most obvious problems in dynamics are highlighted in yellow.



**Figure 4.** State regulation cycle of sustainability of agrarian relation based on rental mechanism. Source: developed by the author.

The first stage is supposed to justify the rational system of rental regulation of agrarian relations in accordance with a current situation. An analysis and monitoring of rental proportions in the agrarian economy is the key element at this stage.

Thus, it is necessary to describe types of rent included in the rental profile. As the following paper stated [47], a monopolistic rent is the highest point of rental income appropriation. A monopolistic rent

is capable of overtaking other types of rent, which is why an increase in its share in the rental income system is considered to be a worst-case scenario. Next, there is monopsonic rent. It also emerges due to market monopolization, but from a purchaser's side, and has a rather negative impact on agricultural businesses operating within a competitive environment.

An information asymmetry rent emerges as a result of deliberate withholding of information by one of the parties involved in economic relations, which also leads to negative processes of artificial monopolization.

Rental income of the orange level (absolute and export-oriented) combines rents of speculative and volatile nature gained by other industries in their cooperation with the agrarian sector. These rents are objective and at the core of induced monopolization; however, they are not connected to it directly. An absolute and export-oriented rent emerges due to absorption of other differential rents within the agrarian industry. Therefore, to ensure sustainability of agrarian relations, the growth rate of the absolute and export-oriented rent must be lower than the growth rate of other types of rent excluding the monopolistic, monopsonic, and information asymmetry ones.

Differential rent I and differential rent II are directly related to productive relations and realization of resource potential in the agrarian sector. It seems logical that the growth rate of rent II should be higher than the growth rate of rent I, as differential rent II is the only type of rent that activates productive relationships, thus increasing efficiency of production and reproduction of resource potential.

Therefore, the complete rental profile defining functionality of agrarian relations is the following:

$$K \begin{pmatrix} R_{ms} \\ R_{mp} \\ R_{as} \end{pmatrix} < K \begin{pmatrix} R_{ab} \\ R_e \end{pmatrix} < K(R_{dI}) < K(R_{dII}) \quad (2)$$

where  $K(R_{mp})$  is the growth rate of factors for monopolistic rent;  $K(R_{ms})$  is the growth rate of factors for monopsonic rent;  $K(R_{as})$  is the growth rate of factors for information asymmetry rent;  $K(R_{ab})$  is the growth rate of factors for absolute rent;  $K(R_e)$  is the growth rate of factors for export-oriented rent;  $K(R_{dI})$  is the growth rate of factors for differential rent I; and  $K(R_{dII})$  is the growth rate of factors for differential rent II.

The presented dynamic normative is a general concept of growth rate ratios between differentiation factors encouraging rental income.

To adjust the normative to a specific industry, it is necessary to determine primary indicators, changes in growth rate ratios between of which would show dynamics of rental income factors and their trends. For instance, dynamics of differential rent II factors (or intensification factors) for the dairy breeding industry can be seen through growth rate ratios between the following primary indicators:

$$K_5 \left( \frac{C_1}{C_0} \right) < K_4 \left( \frac{F_1}{F_0} \right) < K_3 \left( \frac{L_1}{L_0} \right) < K_2 \left( \frac{V_1}{V_0} \right) < K_1 \left( \frac{P_1}{P_0} \right) \quad (3)$$

where  $K$  is the growth rate;  $P_1$  is the profitability of milk production by agricultural enterprises without subsidies in a specific region, %;  $P_0$  is the profitability of milk production by agricultural enterprises without subsidies in the Russian Federation, %;  $V_1$  is the milk production volume in a specific region, in thousand tons;  $V_0$  is the milk production volume in the Russian Federation, in thousand tons;  $L_1$  is the litter size for 100 cows on average in a specific region (number of offspring); and  $L_0$  is the litter size for 100 cows on average in the Russian Federation (number of offspring).  $F_1$  is the feed consumption per one conventional head of dairy cows in the region, centners of feed units;  $F_0$  is the feed consumption per one conventional head of dairy cows in the Russian Federation, centners of feed units;  $C_1$  is the cattle population in a specific region, in thousands; and  $C_0$  is the cattle population in the Russian Federation, in thousands.

These factors demonstrate the efficiency of dairy suppliers in a specific region compared to the country as a whole. Normative ratios between factors are based on basic principles of efficient



production organization: output growth rate (production) > input growth rate (resource consumption) > provision growth rate (main assets). The efficiency equation in the rental form is presented through the same ratios but in the form of fractions (the situation in a region as compared to the country as a whole). In other words, excess performance of an indicator indicates regional differentiation or rent formation factors (in this case, differential rent II formation factors as the key value of a more efficient production organization and a larger impact of economic factors). Agrarian businesses receive differential rent II if the normative ratios presented above are complied with, provided that the normative dynamics for Rmp, Rms, Ras, Rab, Re, and RdI indicators are followed.

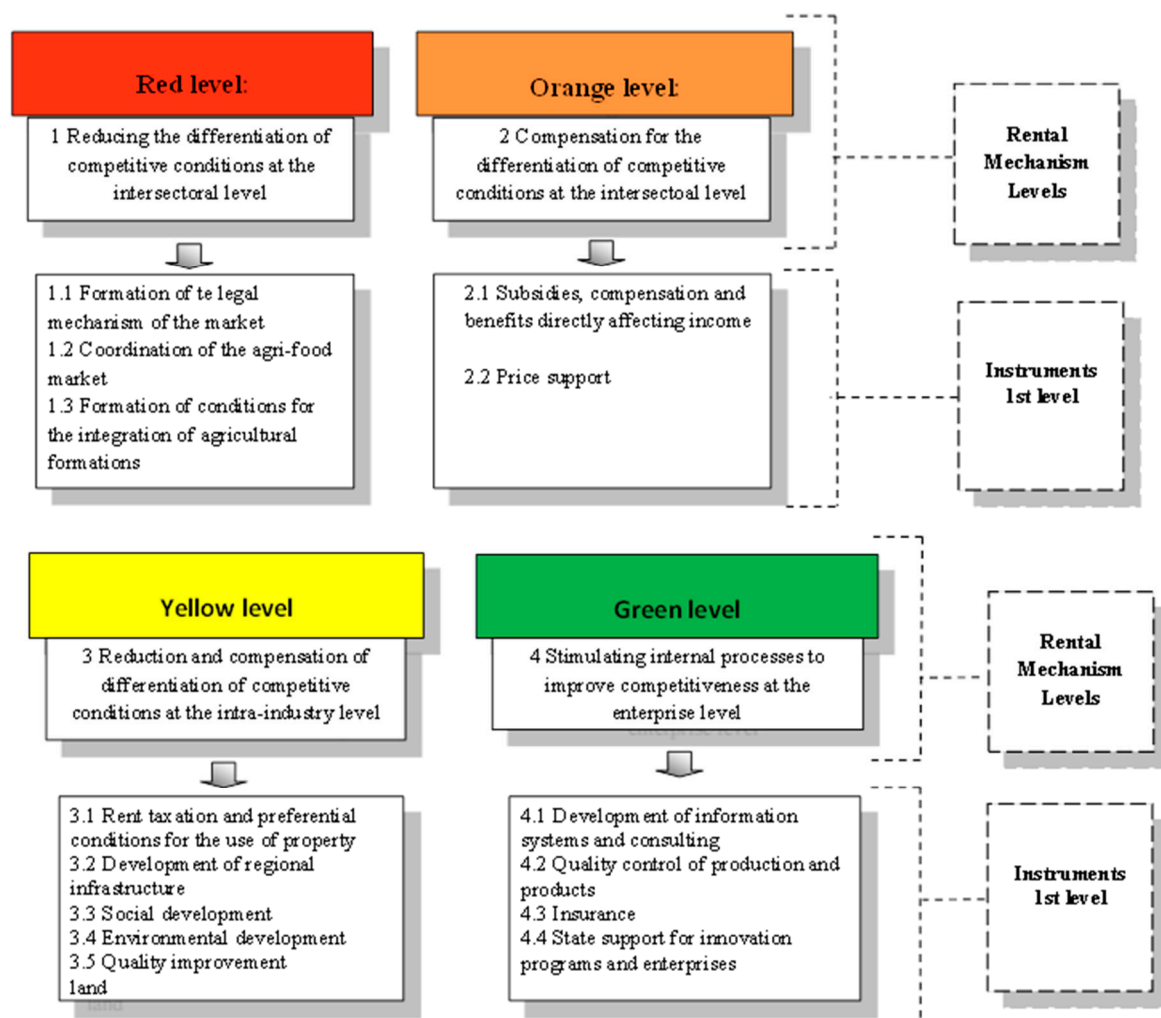
Differentiation indicators in four areas can serve as factors for differential rent I; they are fertility, infrastructure, labor resources, and environmental situation. Indicators in growth rates of investments, labor intensity show the establishment of absolute rent. Indicators in growth rates of prices show the establishment of monopolistic and monopsonic rents. Dynamics of factors for differential rent I of the yellow level show internal interregional factors of the sustainability of agrarian relations, while dynamics of the orange and red levels show internal factors of their sustainability on the inter-industrial level.

Based on the ratios presented above that demonstrate the impact of dynamics of factors for rental income, a normative matrix of the rental profile can be constructed. When compared to a matrix of factual ratios between the growth rate of initial indicators, it can provide an integrated assessment of the sustainability of agrarian relations in a specific region, differentiate the assessment according to rental income levels, and examine the impact of each rental indicator on the final assessment of sustainability with the help of factor analysis, resulting in a list of the main problematic areas requiring state control. Such a model can be used to calculate rental indexes to monitor sustainability on industrial, regional, and state levels, and to run factor analyses.

Thus, the first stage is concluded when the undertaken analysis and monitoring result in problematic areas at the industrial and regional levels. The second stage aims at presenting realistic methods of rental regulation (see Figure 5). Rental regulation methods are grouped in four categories according to the rental income type they have the strongest impact on: the green, yellow, orange, and red levels.

The rental regulatory mechanism of the green level is set to improve the sustainability of agrarian relations from the inside; it creates and encourages internal processes of self-organization and enhances their efficiency; in particular, it stimulates innovation and investment activities. Regulatory measures of the green level establish innovation sustainability of a specific region in particular and of the industry in general, as they help maintain a necessary pace of innovation activity in correspondence with rents of the green level surpassing expected growth rates.

Regulatory measures of the yellow level consider the necessity to decline differentiation in business conditions caused by objective differences in quality of resources. The main objective at this level is to create potentially equal business conditions for all sub-industries and various businesses within the agrarian sector and encourage rational and intensive agriculture activities. This can be achieved through the distribution of rental income from businesses in a more favorable position to less fortunate ones with the help of taxation, adjustment of subsidies, and compensations to specific agrarian businesses. Regulatory measures of the orange and red levels are aimed at establishing supportive external conditions for the agrarian sector. The orange level applies primarily economic regulatory measures to compensate for objectively financially disadvantageous features of agrarian production as compared to more monopolistic industries or industries with products of a higher margin. Thus, the second stage must finish with the determination of areas of high priority for regulation within the agrarian sector and description of regulatory measures that would encourage the self-organization of agrarian relations and lead to stronger synergy.



**Figure 5.** The structure of instruments for state regulation of the sustainability of agricultural relations in the “rental” format. Source: developed by the author.

As part of the third stage, it is planned to use traditional instruments of state regulation of the agro-industrial complex, but taking into account the priority of choosing one other instrument, depending on the identified violations in the operation of rental mechanisms (Figure 5). This will help increase the selectivity of directions and instruments of state support for the agricultural sector of the Russian Federation by increasing the importance of feedback in decisions.

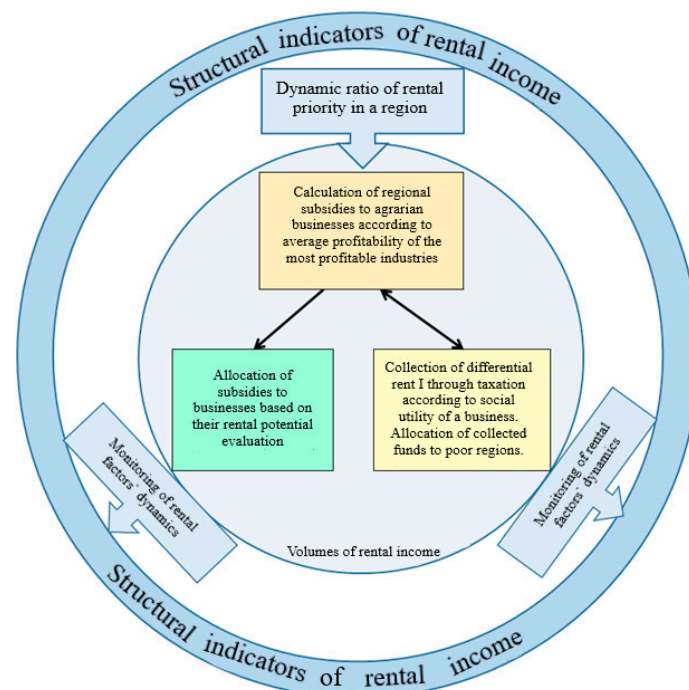
At the same time, the state is assigned the role of the main regulating element of the system, the result of which should be an increase in the sustainability of economic relations as a whole, which, first of all, is achieved through monitoring and control (stage 4), aimed at a dynamic decrease in the volume of formation of rental incomes of unproductive types and a dynamic stimulation of the formation of rental incomes of public benefit, giving economic growth and sustainable development.

Therefore, I believe that the key direction for improvement of a state-managed rental regulation system of the agro-industrial complex in the Russian Federation must be the adjustment of current subsidies and taxation in the agrarian sector in accordance with an analysis of rental income structure that must be performed by every agrarian enterprise, taking into account its special features stemming from external and internal factors.

Regression analysis can be applied to calculate absolute rental income at the level of businesses to assess the impact of rental factors on a final product. The following works [48–50] offer various analytical approaches to calculating rental categories.

In general, rental income calculation can be presented as a variable dependent upon regression factors structured according to rental income types. Moreover, using further modeling, it is possible to calculate the extent to which a dependent variable has formed due to differences between the actual volume of a factor of an object under observation and its lowest level among all analyzed objects under observation [51,52].

In a general form, state regulation principles can be presented as seen in Figure 6. It shows structural (dynamic) indicators of rental income and their extended (absolute) values.



**Figure 6.** Key principles of state regulation within the agrarian sector at the regional level. Source: developed by the author.

Here, a total volume of financial support allocated to a region can be adjusted according to a rental priority dynamic ratio of the said region using a model based on the rental profile (assessment of the rental income structure). Further allocation of subsidies to businesses can be made based on an assessment of their rental potential with the use of regression analysis (absolute assessment of rental income). Regional differentiation can be declined through taxation of agricultural land according to calculated differential rent I and the development of poor regions [52,53].

#### 4. Conclusions and Discussion

Answering the questions posed in the introduction, it should be noted that the task of the state should be to maximally reduce the differentiation of conditions that determine the formation of rental incomes of the red, orange, and yellow levels. At the green level, it is important, on the contrary, to stimulate the formation of such a differentiation at the expense of the internal capabilities of the enterprise for more efficient use of resources. Thus, the development of scientific and technological progress determines the ever-increasing role of innovative and technological rent. This complicates the processes of state regulation of movement and redistribution of rental income, since an important task arises to prevent the transformation of innovative, technological, and differential II rents into monopoly, status, and administrative rents, which can lead to negative effects for the economy as a whole.

With regard to the agrarian sector, the period for setting such a barrier could be a five-year period. It is important that all the individual differential rental income of the second kind created during this period remains at the disposal of the agricultural enterprise. However, in order to preserve the

productive vector of using rental income in the future, it is necessary that, after 5 years, the formation of individual differential rent II, created through innovations in the past five-year period, acquires a social character, prompting further innovations in agricultural production.

The withdrawal of differential rent II, which is of a public nature, is quite simple to carry out only in the case of a transition to the rent principle of allocating state support funds in the agro-industrial complex, taking into account the specific situation both in the region as a whole and at each enterprise (for example, through a proportional decrease in the amount of state support). All these measures will ultimately make it possible to significantly speed up innovation and intensification processes in the agricultural sector. Thus, the management of rent-seeking behavior of economic agents through its shift towards the productive vector of development will create a basis for a significant increase in the sustainability of agricultural relations.

In conclusion, the proposed changes in state regulation methods in the agrarian sector may be applied to create the foundation for sustainable agricultural development during declining differentiation of business conditions. These changes must be evolutionary, and they should not require changes to tax legislation. In particular, the following initial application steps can be proposed:

- Preservation of the planned volume of state subsidies given to the agrarian sector and of the current tax system;
- The rule of 10%: maximum possible adjustment of subsidies for each agrarian business within the range of  $\pm 10\%$  taking into consideration differential rent II made by a business due to personal achievements, and differential rent I as a quality indicator for internal business conditions;
- Calculation of differential rent II for every product produced by a business, +5% to the best ones, 0% to average ones, and -5% to the worst ones according to the efficiency of resource utilization during the preceding period;
- Calculation of differential rent I for every product produced by a business, -5% to the best conditions, 0% to average ones, and +5% to the worst ones (natural and infrastructural ones);
- Formulation of proposals to change tax legislation to allocate differential rent I via the state taxation system.

Further development of the proposed plan should be centered around the rental structure of the green level with a stronger accentuation of innovation, technological, organizational, and other types of rent within differential rent II. As the following works [36,38,49–51] suggest, it will create the environment for encouraging innovation activities and bring more results.

These measures will help study factors of sustainability in rent-efficient agrarian businesses in more detail and make them the starting point for regions, eventually resulting in higher efficiency of state subsidies in the agro-industrial complex. In order to introduce the proposed plan into application by departments of the Ministry of Agriculture of the Russian Federation, detailed regulatory documents must be compiled, framing principles and rules of state regulation on the dynamic basis of rent in the agro-industrial complex.

Rental approaches to regulation may also be in demand within the framework of the implementation of the common agricultural policy in the EU for a more effective reduction of interregional differentiation at the social and environmental levels [42,43,54].

The rent-oriented regulatory principles of sustainability of agrarian relation presented in this paper could be used to create a methodological framework for a universal rental policy not only within the agrarian sector in particular but also in other industries that receive resource rents and in the economy in general.

**Funding:** Academic Excellence Project 5-100 granted by Peter the Great St. Petersburg Polytechnic University.

**Acknowledgments:** This research work was supported by the Academic Excellence Project 5-100 granted by Peter the Great St. Petersburg Polytechnic University.

**Conflicts of Interest:** The author declares no conflict of interest

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