On the way to ecological agriculture: decision-making process in agrarian state policy

T Skryl¹*, V Osipov² and T Vorozheikina³

¹ Plekhanov Russian University of Economics, 36 Stremyanny pereulok, Moscow 117997 Russia
² MGIMO University, 76 Vernadskogo prospekt, Moscow 119454 Russia
³ Russian State Agrarian University - Moscow Timiryazev Agricultural Academy, 49 Timiryazevskaya str., Moscow 127550 Russia

E-mail: t_skryl@mail.ru

Abstract. Modern transformations in the global economy radically changed the food supply system of the population, necessitating the formation of a new agrarian policy and the implementation of a system of tactical and long-term strategic state measures. Scientifically based economic and agricultural policy is the most important condition for stabilization and effective development of the agroindustrial complex, the factor of growth of well-being of the population and ensuring a food security of any state. The main goal of the agricultural policy is to create the institutional conditions that would allow producing a competitive product and enhancing the competitiveness of agricultural enterprises. The authors tried to search the inconsistencies in the implementation of institutional reforms in the agricultural sector on the example of the Russian Federation. Based on works of outstanding theorists of institutional science (A. Pigou and R. Coase), two directions of institutional reforms have been identified. The authors show the distinctions of these directions and possible ways of practical realization of them in the agricultural sector. The problem of weak market power of traditional producers of agricultural raw materials is revealed. The transition to ecological agriculture is able to increase the market power of agricultural producers in the reproduction process that would automatically lead to better balance of income distribution between main actors in the reproduction process, while improving the quality of products for the consumers.

1. Introduction

State agrarian policy is an integral part of the state social and economic policy aimed at sustainable development of agriculture and rural areas. Since agrarian policy is a part of state social and economic policy, it must obey the general principles of the latter's formation. Ecological agrarian policy is a strategic concept of the state to create institutions, norms for the effective implementation of innovative environmental, resource-saving technologies that increase the competitiveness of agricultural producers and the quality of final products.

Preservation and strengthening of the resource base of agricultural production is one of the most important conditions for the effective functioning of the country's agricultural complex. Necessity of this is determined not only by economic factors, but by the fact that without natural components, agriculture cannot exist in principle and the land is the main component of the productive forces. Lately, the humanity has achieved incredible successes such as it introduced new technologies, which
created new modern production. One can have the latest technology but illiterately applying them, finally one gets a negative result. How well represented in the ecological agricultural policy environmental, resource-saving aspects, it is possible to judge how much it meets modern directions of state policy. Through the creation of various institutions, the state should form a decision-making structure in the agrarian policy for achieving high results. Agricultural workers should know the basics of environmental knowledge, form a respectful attitude to the surrounding natural world, an understanding of the irreplaceability of a number of its components. The production process should be based on design and engineering solutions for ecologically adapted units, the acquisition of the machine and tractor fleet based on the zonal approach, the development and application of resource-saving technologies. What is the point of equipping the village with special tillage equipment or introducing soil protection technologies if the rural worker is not prepared? It simply does not have elementary ecological knowledge. Conversely, knowledge is useless if there are no proper technical means and technologies in service. In either case, the ecological effect is unlikely; moreover, real damage is done to natural resources.

In this context, it is appropriate to mention the statement of the well-known philosopher Vladimir Vernadsky on the unity of the biosphere and humanity, “... The life of humanity, for all its heterogeneity, has become indivisible and united. The event that occurred in the provincial corner of any point of any continent or ocean is reflected and has consequences – large and small – in a number of other places, everywhere on the surface of the Earth” [22]. Therefore, the more human actions in society are consistent with the laws of nature, the more successful these actions are for society and vice versa. In reality, the pursuit of short-term gains and profits often forces people to carry out intensive exploitation of nature, not fully reckoning with its laws [20].

Ecological agriculture not only combines old production methods with new technologies, but also it is more attractive to consumers, so the market power of agricultural producers is substantially growing. The consideration of nature not as a means of production but as a living system, i.e. the replacement of a purely consumer approach to nature by a careful attitude, is socially significant, socially approved and business-successful, as the practice of such firms in the consumer market shows. Their participation in the reproduction process more active, they allow a easier part in cooperation with each other, form a network of marketing their environmentally friendly products at prices higher than traditional products [10].

According to the ideology of ecologically oriented agrarians, nature is not a resource, from which it is necessary to squeeze the maximum number of products, exhausting the soil. For them, it is important to focus on closed production cycles, increase the fertility of soils with organic fertilizers, and restore damaged soils using the principles of biological synergy [23].

Here they matter:

- Rejection of chemicals (herbicides, pesticides, fungicides, chemical fertilizers, antibiotics, etc.)
- Use of organic fertilizers;
- Wide use of the crop rotation system for soil conservation and their natural regeneration in the production process;
- Use of fields “under steam” for cultivation of green fertilizers;
- Biological methods of plant protection;
- User of agroforestry technologies.

Environmental agriculture should be a natural and non-destructive element of living nature [21].

2. Materials and Methods
Understanding the fact that environmental agrarian policy is expressed in a strategy to increase the efficiency of agricultural production, which in turn requires the protection of the economic interests of
agricultural producers against the anti-competitive behavior of foreign farmers, allows us to determine the institutional directions for the implementation of environmental agrarian policy.

We will turn to the consideration of the institutional aspects of environmental agrarian policy a little later, and now we need to define the institutional framework for agrarian policy in terms of its purpose and principles.

The main goal of the agrarian policy is to create such institutional conditions that would create a competitive product and enhance the competitiveness of agricultural enterprises.

The principles of agrarian policy are reduced to a sequence of measures of state agrarian policy, institutionalization and targeting of state support, the formation of civilized market conditions in the agrarian products market, and the openness of agrarian policy.

The main directions of the agrarian policy should be called protection of the interests of domestic agricultural producers and the formation of institutional conditions for sustainable development of the agrarian sphere, which follows from the normative definition of agrarian policy.

Having a circle of restrictions and mandatory requirements, it remains to determine the institutional directions for the implementation of agrarian policy, as part of the socio-economic state policy.

The interests of domestic agricultural producers received special institutional support in connection with the introduction of prohibitive measures within the import substitution policy. New institutions have created new conditions for expanding the production of agricultural products.

Professor of the Stockholm School of Economics S.-E. Sjostrand gave the clearest description of the institute, “…When expectations become stable and shared by a multitude of people, a social norm emerges. The totality of social norms based on mutual expectations becomes an institution” [8].

Having some idea about the behavior of the initiator of the institute, it is necessary to determine the direction and actions of the actors – the participants of economic relations in the institutional environment undergoing modernization through the introduction of a new institution. The action of economic agents, as we will see, also obeys a certain logic, depending on the source of the institution's origin, the quality of the institution and the type of direction of institutional reform.

It should be noted that the main problem in the system of public administration in the agrarian sector is revealed through the synthesis of orderliness and predictability of the actors’ relations and behavior, and the need for constant development by introducing changes in the attitudes and behavior of the same actors.

The building of a system of decision-making in public administration is based on the solution of this problem through the search for a balance of reasonable conservatism and the necessary dynamism.

Within the framework of the search for a balanced approach for constructing a decision-making system, let us consider two approaches to the implementation of institutional reforms: Pigovian way, based on the writings of A. Pigou and the other way, based on the works of R. Coase.

The Pigou’s direction of economic policy assumes the formation of a system of public administration institutions that forces the actors to act in accordance with the interests of the initiator of the institution. The initiator of the institute (state) in this case assumes the role of coordinator of the needs of society.

The Coase’s direction, on the contrary, proposes the solution of three problems of institutionalization of the economy: development of competition, protection of property rights, and minimization of transaction costs. It is assumed that the actors should act independently in the interests of both the initiator of the institution and society as a whole.

The Coase’s direction of institutional reform is more preferable than the Pigou’s one because of the possibility of greater symmetry in the distribution of information relative to the imported institution.

In the case of Russia, the implementation of the institutional reform in the agrarian sphere began (since 1992) with the emergence of the institution of private property, the reduction of monopoly against the anti-competitive behavior of foreign farmers, allowing us to determine the institutional directions for the implementation of environmental agrarian policy.

We will turn to the consideration of the institutional aspects of environmental agrarian policy a little later, and now we need to define the institutional framework for agrarian policy in terms of its purpose and principles.

The main goal of the agrarian policy is to create such institutional conditions that would create a competitive product and enhance the competitiveness of agricultural enterprises.

The principles of agrarian policy are reduced to a sequence of measures of state agrarian policy, institutionalization and targeting of state support, the formation of civilized market conditions in the agrarian products market, and the openness of agrarian policy.

The main directions of the agrarian policy should be called protection of the interests of domestic agricultural producers and the formation of institutional conditions for sustainable development of the agrarian sphere, which follows from the normative definition of agrarian policy.

Having a circle of restrictions and mandatory requirements, it remains to determine the institutional directions for the implementation of agrarian policy, as part of the socio-economic state policy.

The interests of domestic agricultural producers received special institutional support in connection with the introduction of prohibitive measures within the import substitution policy. New institutions have created new conditions for expanding the production of agricultural products.

Professor of the Stockholm School of Economics S.-E. Sjostrand gave the clearest description of the institute, “…When expectations become stable and shared by a multitude of people, a social norm emerges. The totality of social norms based on mutual expectations becomes an institution” [8].

Having some idea about the behavior of the initiator of the institute, it is necessary to determine the direction and actions of the actors – the participants of economic relations in the institutional environment undergoing modernization through the introduction of a new institution. The action of economic agents, as we will see, also obeys a certain logic, depending on the source of the institution's origin, the quality of the institution and the type of direction of institutional reform.

It should be noted that the main problem in the system of public administration in the agrarian sector is revealed through the synthesis of orderliness and predictability of the actors’ relations and behavior, and the need for constant development by introducing changes in the attitudes and behavior of the same actors.

The building of a system of decision-making in public administration is based on the solution of this problem through the search for a balance of reasonable conservatism and the necessary dynamism.

Within the framework of the search for a balanced approach for constructing a decision-making system, let us consider two approaches to the implementation of institutional reforms: Pigovian way, based on the writings of A. Pigou and the other way, based on the works of R. Coase.

The Pigou’s direction of economic policy assumes the formation of a system of public administration institutions that forces the actors to act in accordance with the interests of the initiator of the institution. The initiator of the institute (state) in this case assumes the role of coordinator of the needs of society.

The Coase’s direction, on the contrary, proposes the solution of three problems of institutionalization of the economy: development of competition, protection of property rights, and minimization of transaction costs. It is assumed that the actors should act independently in the interests of both the initiator of the institution and society as a whole.

The Coase’s direction of institutional reform is more preferable than the Pigou’s one because of the possibility of greater symmetry in the distribution of information relative to the imported institution.

In the case of Russia, the implementation of the institutional reform in the agrarian sphere began (since 1992) with the emergence of the institution of private property, the reduction of monopoly against the anti-competitive behavior of foreign farmers, allowing us to determine the institutional directions for the implementation of environmental agrarian policy.
of the public administration system were reoriented not to the three basic Coase’s conditions, but to the Pigou’s susceptibility to political decisions.

One of the proofs of this proposition is the strengthening of monopoly in the Russian economy and the agrarian sector, in particular. Russian outstanding historian and researcher A. V. Chayanov also notes the frequency of monopolization processes in agriculture, “... by repeating the stages of development of industrial capitalism, agriculture, leaving semi-natural forms of existence, falls under the authority of trade capitalism, which is in the form of very large commercial enterprises engaging the mass of isolated farms... Developing the system of bonded loan, the state makes the organization of agricultural production to a special kind of transfer office, built on “system of squeezing sweat” [2].

3. Results and Discussion
An important problem remains the choice of the direction of institutional reforms and the building of decision-making system by actors. In order to change the course from the Pigou’s direction of the interaction of institutions in agrarian policy, it is necessary to introduce new norms, which, in turn, should create competitive advantages for participants in economic relations in the institutional environment.

New norms and institutions can create ecological agriculture, which is an alternative to traditional agricultural production. The former agriculture was a weak link in the reproduction process due to the consumption of large amounts of water, energy, pesticides, and fertilizers [9].

If we analyze the current Russian agricultural practices, a high degree of monopolization of the economy and colossal transaction costs are hampering the change in approach and increasing the interaction of institutions. In particular, monopolization and high transaction costs in agriculture still significantly affect the marketing of agricultural products. Agricultural commodity producers often prefer to sell products “off the field.” Despite the fact that ownership was realized in the privatization of collective farms and state farms, or through the direct purchase of land and means of production in a free market, the problem of monopoly and high transaction costs did not allow the formation of a self-organizing market infrastructure in which agricultural producers could freely and profitably sell their products, and buyers could receive high-quality food. Why is this happening? Agricultural producers and consumers of their products are located at large distances from each other, as well as in time, raw materials, and semi-finished products undergo several operations of the manufacturing process to obtain the finished product. With the introduction of new technologies, the infrastructure of the market has changed, new participants in the reproductive process have been added, but one problem has remained the same. Namely, the level of transaction costs for the agricultural commodity producer has remained quite high, which does not allow them to play the role of an active participant in the food market. The high level of transaction costs can be explained by two reasons: the geographic and temporal disconnection of the producer and the consumer, which leads to transport costs, as well as to storage costs, but at the same time, the costs of organizing distribution channels-wholesale and retail business-play a role. In addition, the processing of agricultural raw materials and the packaging of the product are important. In sum, these costs are unaffordable for the agricultural commodity producers, which forces them to take a passive part in the reproduction process and sell products “off the field” at a low price. Now the agricultural commodity producer has a choice of ways to sell their goods. If they sell products directly to the consumer, they can get a good price, but they must spend time and effort (to invest labor) for their marketing, at the same time to carry out production at the enterprise. The second way of selling products is to sell the entire crop to intermediaries, merchants for a low price. In other words, in agriculture there is no institution that performs the functions of storage, transportation, processing, packaging at the right time and in the right place for the consumer.

The effectiveness of marketing agricultural raw materials and products determines how much agriculture is integrated into the reproduction process. If marketing receives a larger share of profits from the sale of finished products, then the role of agricultural production as an actor of the
reproduction process is extremely weak. In this situation, market power is largely in the hands of the marketing sector, and it dictates the conditions for the functioning of markets for all other participants (both producers of agricultural raw materials and products and final consumers of products). Such an interaction of institutions corresponds to the Pigou’s direction of the formation of agrarian policy.

In these conditions, the sales companies also determine which prices are formed for the producer of raw materials and for the consumer of the final product with this proposal and this demand for agricultural products. In developed countries, the distribution of food is rather highly developed and regulated not only by market laws but also by regulatory regulations. It is completely wrong to assume that the law can establish prices for products, but it is possible to form such favorable conditions for all participants in the reproduction process that production is expedient in all operations of the reproductive process. Currently for Russia, we should mention the imbalance in the rate of profit in the different operations of the reproductive process, when some participants have a very high level, while others are teetering on the verge of profitability. It is important to note that such a situation is not only abnormal from the point of view of market relations, but also from the point of view of food security, since the imbalance makes the production of domestic products difficult. As it was just recently, it leads to the dominance of imports, as the marketing firms are interested in guaranteed and large-scale deliveries, which the underdeveloped agriculture cannot provide.

The researcher A. V. Chayanov described the marketing process of agricultural products more than half a century ago [2]:

- Phase I. Goods spread by individual producers is collected by a number of dealers and concentrates in their hands.
- Phase II. The goods collected by dealers are subjected to rough sorting and transported to local wholesale trade centers.
- Phase III. In wholesale centers, the goods are sorted and distributed along the lines of further movement.
- Phase IV. Collected and sorted in the center goods are transported to local consumer wholesale centers.
- Phase V. From local wholesale centers, the goods are supplied to the distributor through local shopkeepers and other traders.

With the exception of some features and modern technologies, the structure of the sales process has changed little. This indicates the inflexibility of the institution of sale for the agricultural market. Hence, there are forces that support such a market structure and the level of market power of the participants in the reproduction process. It is impossible to recognize such structure as effective due to the imbalance of interests and the rate of profit among participants in the reproduction process. Although the imbalance in the rate of return in transactions within the value chain is characteristic of any production process. Nevertheless, it is in the agrarian sector and food supply that it is most sensitive to consumers and producers of agricultural raw materials. Food security is much more important than compliance with the requirements of free market exchange, so it is simply necessary to establish institutional conditions that will contribute to striving for a balance of ensuring the interests of all participants in the reproduction process, and not only that part related to sales.

4. Conclusions
In the recent past, the institute of sales tried to transform by increasing the efficiency of collective farms, they were restructured. As a result, according to the plan of the reformers, a new layer of effective farmers-producers of agricultural products was to be formed. In fact, the sales market began to function as before. The main error lies in the belief that the economy of the capitalist market will arise spontaneously, once private property is established, free prices are introduced, the monetary system is stabilized, and unregulated, competition-based markets are created. The researcher A. A.
Nikonov noted, “... the absence of agricultural cooperation does not allow solving many tasks ... to organize sales, supply, storage, processing, and sale of products. Today, there is no real, legalized agricultural cooperation in Russia” [14]. Another researcher G. I. Shmelyov also noted, “In the relations between the agrarian sector and the processing industry and trade, integration ties based on the creation of co-operative type associations with the distribution of incomes in accordance with participation in the costs of the final product should be disseminated” [19]. We definitely agree with the opinions of the researchers, but it remains a question of technique – how to do it.

In this regard, efforts should be directed towards to find institutions that can indirectly influence the process of distributing profit within the value chain from obtaining raw materials to bringing the finished product to the final consumer. Transforming the institute of marketing of agricultural products will help the emergence of new forms of management and technology in the transition to ecological agriculture [25].

German experience shows how agricultural producers-farmers, as the weakest participants in the reproduction process, were able to strengthen their role by forming cooperatives. The operations of the reproductive process, which are characterized by the unification of the flows of material resources, can be transferred to the new cooperative institution. Participation in the cooperative agricultural producers allows them to gain greater market power by providing large volumes of products standardized by new environmental standards in an understandable and predictable timeframe. Thus, Bavarian farmers receive seed materials, ecological fertilizers, equipment, growing seedlings, etc. from cooperatives, carry out the production process in strict accordance with environmentally friendly technology, which is monitored by the specialists of the cooperative. At certain times, farmers give products to the cooperative, which provides not only the collection but also the processing of raw materials at their own processing plants. Cooperatives allow farmers to strengthen their market power by participating in the management of neighboring operations of the production process. Some cooperatives turn out to be the main shareholders of processing enterprises and trade networks, which increases their market power even more, and the process of profit distribution makes it fairer and more interesting for producers of agricultural raw materials. It should be noted that the European agrarian policy is based on subsidizing to producer prices of substantial payments for the implementation of a finished production program that meets environmental standards. For Russian practice, this reason can be neglected, since we are only interested in the institutional structure that allows us to achieve a more balanced distribution of profits among the participants in the reproduction process. However, we should not forget that the yield in the system of ecological agriculture is lower than when using chemical fertilizers; however, that is why ecologically clean products are more expensive than traditional ones. On the other hand, consumers who follow their health and are committed to nature protection prefer these products and are ready to pay higher prices for them. Simultaneously, a higher price for such products and sustained supported demand forms a more significant market power of such producers and makes them more serious players in the food market.

We assume that the transition to ecological agriculture should require institutional state support, and then such production would prove to be more effective and weighty players in the agricultural market than traditional farms.

The reported study was funded by RFBR according to the research project № 16-02-00141.

References
[1] Ceppa C 2011 Alternative Farming Systems, Biotechnology, Drought Stress and Ecological Fertilisation (Netherlands: Springer)
[2] Chayanov A V 1989 Peasant Farming Economics (Moscow)
[3] Coase R 1992 American Economic Review 82(4) pp 713–719
[4] Coase R 2006 Journal of Economics & Management Strategy 15(2) pp 255–278
[5] Dent D, Boincean B P and Krupenikov I A 2011 The Black Earth: Ecological Principles for
Sustainable Agriculture on Chernozem Soils (Netherlands: Springer)

[6] Volkova E E, Dubrovsksy V Zh and Yaroshevich N Yu 2017 *International Journal of Applied Mathematics and Statistics* **56**(6) pp 11-28

[7] Evsukov S G, Sigarev A V, Ustyuzhanina E V and Zaytseva E V 2016 *Journal of Internet Banking and Commerce* **21**(6) pp 17

[8] Groenewegen J, Pitelis C and Sjostrand S-E 1995 On Economic Institutions: Theory and Applications. Aldershot: Edward Elgar pp 233

[9] Hawken P, Lovins A and Lovins H 2000 *Oeko-Kapitalismus. Die industrielle Revolution des 21. Jahrhunderts*

[10] Jacobs M 2012 Green Growth: Economic Theory and Political Discourse. Centre for Climate Change Economics and Policy. Working paper No **108**

[11] Kyriacos Aristotelous 2017 *International Journal of Ecology & Development* **32**(1) pp 1-17

[12] Lindenmayer D B, Cunningham S and Young A Land Use Intensification: Effects on Agriculture, Biodiversity and Ecological Processes (CSIRO Publishing, 2012)

[13] Locke R 2001 Building Trust. *Paper presented at the Annual Meetings of the American Political Science Association* (San Francisco, USA)

[14] Nikonov A A 1995 Spiral of centuries-old drama: agrarian science and politics of Russia (XVIII-XX centuries) *Encyclopedia of Russian villages* (Moscow, Russia) p 476

[15] Osipov V S, Skryl T V, Blinova E A, Kosov M E, Zeldner A G, Alekseev A N 2017 *International Journal of Applied Business and Economic Research* **15**(15) pp 193-203

[16] Parvatha P 2017 *Reddy Agro-ecological Approaches to Pest Management for Sustainable Agriculture* (Singapore: Springer)

[17] Pigou A 1910 Producers' and Consumers' Surplus, *EJ*

[18] Pigou A 1947 Economic Progress in a Stable Environment *Economica*

[19] Shmelyov G I 2000 *Agrarian Policy and Agrarian Relations in Russia in the Twentieth Century* (Moscow, Russia: Nauka) p 253

[20] Skryl T V 2017 *International Journal of Ecological Economics and Statistics* **38**(2) pp 33-48

[21] Stern N 2007 *The Economics of Climate Change* (Cambridge, UK: The Stern Review)

[22] Vernadsky V I 2012 *Biosphere and Noosphere* (Moscow, Russia: Iris Press) p 576

[23] Weizsaeccker E U von 1989 Erdpolitik Oekologische Realpolitik an der Schwelle zum Jahrhundert der Umwelt, (Darmstadt, 1989)

[24] Bogoviz A V, Alekseev A N, Kletskova E V, Kuznetsoy V Y and Cherepukhin T Y 2018 Territories of advanced economic development as the most favorable environment for the development of a modern man *Quality - Access to Success* **19**(S2) pp 161-165

[25] Nechaev V I, Mikhaylushkin P V, Sayfedtina N R and Aliava A R 2016 Tendencies of demand in the market of organic food products in Europe *Economics of Agriculture of Russia* **10** pp 53-60