SUSTAINABLE DEVELOPMENT MANAGEMENT: STATE SUPPORT FOR THE ENVIRONMENTAL COMPONENT OF THE AGRICULTURAL SECTOR

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To ensure the long-term development of agriculture, it is necessary to consider economic, social, organizational, and environmental factors. Each of these aspects plays a crucial role in the formation of an effective management system and the implementation of agricultural policy at various levels. Given the potential negative impact of agricultural activities on the environment and the risk of deteriorating food security due to environmental changes, it is particularly important to focus on improving methods of sustainable agricultural development management, taking into account environmental aspects. Research by Ukrainian and foreign scientists indicates that the issue of ensuring sustainable agricultural development is relevant and requires in-depth study. Despite the existence of numerous scientific works devoted to the impact of environmental factors on the functioning and efficiency of the agricultural sector, a unified and comprehensive concept for the use of environmental instruments to ensure sustainable agricultural development has not yet been developed. Therefore, there is an urgent need to address this task.

The environmental component of sustainable agriculture involves the responsible use of natural resources, such as land, water, and biodiversity, to prevent harm to the environment. This implies: optimization of land resource use: combating soil degradation, including erosion, acidification, and salinization, and enhancing soil fertility through the use of organic fertilizers and other environmentally sound methods. Rational use of water resources: implementing water-saving irrigation systems and protecting water sources from pollution. Conservation of biodiversity: protecting flora and fauna from the negative impacts of agricultural activities, maintaining ecological balance. Responsible food production and consumption: producing environmentally friendly products, reducing waste, using eco-friendly packaging, and promoting conscious consumption. It is important to emphasize that sustainable agriculture is not only about preserving nature but also about ensuring food security for future generations [1].

An important direction in ensuring sustainable agricultural development through the environmental component is the implementation of a closed-loop economy. This involves the reuse of agricultural sector waste, for example, for electricity generation. Research indicates that a significant portion of agro-industrial waste can be converted into energy, which addresses not only environmental but also energy and, in part, food security issues. According to researchers [2], one way to reduce the negative impact of agriculture on the environment is the active implementation of organic farming. As defined by the Food and Agriculture Organization of the United Nations, organic agriculture is a holistic production management system that 1 promotes and enhances agroecosystem health, including biodiversity, biological cycles, and soil biological activity. 2 This system involves the use of management methods that focus on the use of non-agricultural resources, taking into account regional specificities. Organic farming is achieved through the use of agronomic, biological, and mechanical methods instead of synthetic materials. Thus, the transition to organic farming has a positive impact on food security, as organic products improve the nutritional quality of the population's diet.

Research on Lithuania's experience in sustainable agriculture demonstrates that organic farming holds significant potential. It contributes to addressing environmental challenges, such as soil degradation and rational water use, while maintaining yield levels comparable to conventional agriculture. An analysis of Polish experience also illustrates that the implementation of ecological innovations can substantially improve the development of the agricultural sector. However, successful transition requires significant support from the state.

Researchers [6, 13] highlight several key factors that determine the formation of sustainable agriculture: sustainable development requires not merely random actions but a carefully planned state strategy; the implementation of ecological innovations necessitates significant investments from both the private sector and the state, the results of which will become evident only in the long term. The transition to an agricultural economy aimed at ensuring food security is possible only with political will and support for this idea at both national and international levels. Thus, this study, once again, but from a different perspective, underscores the importance of the active role of state and international organizations in creating sustainable agriculture and ensuring food security. Consequently, an analysis of scholarly works on the prerequisites for ensuring the sustainable development of the agricultural sector of the economy has confirmed the crucial role of the ecological channel in this process, which, in turn, necessitates the development of relevant tools for utilizing ecological factors in the context of managing the sustainable development of the agricultural sector of the economy.

The management of sustainable development in the agricultural sector of the economy encompasses several sequential stages: Analysis and evaluation of the current state of the managed system. This involves examining both quantitative indicators that reflect the outcomes of sustainable agricultural sector development and qualitative factors that influence them (environmental, economic, social, and institutional); forecasting the potential impact of various factors on the sustainability indicators of the agricultural sector and developing specific measures to achieve desired outcomes; implementation of planned activities, monitoring their execution, analyzing deviations of actual indicators from planned ones, identifying the causes of these deviations, and adjusting the sustainable development management strategy of the agricultural sector based on the acquired data.

A detailed analysis of the relationships between environmental factors and sustainability indicators of the agricultural sector of the economy has been conducted. This allowed for the identification of the most significant factors influencing the level of sustainability of the agricultural sector, determining the strength, direction, and time lag of their impact. The results obtained substantiate the selection of management tools for the sustainable development of the agricultural sector through the environmental component and serve as an informational basis for making effective management decisions [10].

In previous studies [9], it has been empirically substantiated that for 28 post-socialist bloc countries (Azerbaijan, Albania, Belarus, Bulgaria, Bosnia and Herzegovina, Armenia, Georgia, Estonia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Poland, Russia, Romania, Serbia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Hungary, Uzbekistan, Ukraine, Croatia, Czech Republic, Montenegro), the most relevant environmental determinants affecting the level of sustainable development of the agricultural sector of the economy (results obtained based on a correlation analysis of the relationships of a set of 35 diverse environmental factors with an integrated indicator characterizing the state of food security of the country) are the following:

- methane emissions from the agricultural sector of the economy;
- nitrous oxide emissions from the agricultural sector of the economy;
- carbon dioxide emissions (metric tons per capita);
- arable land (% of total land area);
- forest cover (% of total land area);
- access to clean fuels and technologies for cooking (% of the population);
- access to electricity (% of the population);
- electricity losses during transportation and transmission (% of total electricity production);
- electricity production from renewable sources (% of total electricity production);
- fertilizer consumption (kg/ha of arable land);
- yield (kg/ha).

Thus, it has been empirically confirmed that emissions of pollutants; electricity production, its supply and consumption; the use of forest and land resources; the use of fertilizers; and crop yield

are the main vectors of targeted influence of the management subsystem within the framework of managing the sustainable development of the agricultural sector of the economy, and therefore, an appropriate set of specific regulatory instruments should be developed and used in the context of the identified vectors.

Thus, the main de-stimulating factor in the context of the environmental channel is the increase in emissions of various types of greenhouse gases (both directly by the agricultural sector of the economy and from other anthropogenic sources). To address this problem, the following instruments and measures of state regulation are proposed:

A large-scale "viral" information policy to highlight the negative consequences of greenhouse gas emissions for the environment. In the context of this area of targeted influence, it is necessary to develop a comprehensive campaign involving the media to, on the one hand, create a negative attitude in society towards economic entities whose activities lead to environmental pollution, as well as the use of social and media mechanisms (e.g., social advertising) to substantiate the scale of the environmental disaster if the current trend in the dynamics of greenhouse gas emissions continues, and on the other hand, to foster a responsible attitude towards the environment among the population.

2. The use of financial and economic instruments (providing tax incentives, preferential lending, targeted budget financing, public-private partnership programs) for the modernization and technical re-equipment of agricultural enterprises and their transition to organic agriculture. In terms of providing tax preferences, in particular, it is possible to introduce a temporary reduced income tax rate for those agricultural enterprises that reinvest their profits in modernization and technical re-equipment. Within the framework of preferential lending, it is possible for state-owned banks to provide loans to agricultural enterprises for modernization and technical re-equipment at preferential rates. Targeted budget financing may involve the development of a specialized state program for the allocation of financial resources on a competitive basis among applicant agricultural sector enterprises for their modernization and technical re-equipment (among the key criteria on which decisions should be based are the following: profitability index, expected intangible effect (e.g., potential results of the modernization of the agricultural enterprise for the region's ecosystem, etc.), as well as justification of other factors that determine the priority of this investment project compared to others both for the agricultural enterprise itself and for the state). However, the most promising and effective instrument in this block is the development of public-private partnerships, i.e., financing investment projects for the modernization and technical re-equipment of agricultural enterprises based on co-financing between private and public investors, since this instrument allows for the maximum balancing of the interests of both parties, as well as their interest in the effective implementation of this project.

3. Approval of relevant regulatory documents regarding the monitoring, reporting, and verification of greenhouse gas emissions. The importance of developing and implementing a system for monitoring, reporting, and verifying greenhouse gas emissions in Ukraine, on the one hand, is an integral part of fulfilling Ukraine's international obligations (in the context of greenhouse gas emission trading and the transition to low-carbon development, as provided for by the Paris Agreement), and, on the other hand, is an important prerequisite for adapting domestic business to the rules of operation of enterprises in developed countries, where sustainable development and corporate social responsibility are fundamental concepts for building economic relations. Thus, the introduction of monitoring, reporting, and verification of greenhouse gas emissions will allow for the accumulation of adequate and up-to-date information on the volumes and types of greenhouse gas emissions in relevant state registers, on the basis of which pricing will be carried out, which, in turn, will allow for the establishment of trading in these gas quotas and control over the level of eco-destructive processes in our country. At the same time, permanent monitoring and trading in greenhouse gas emission allowances will provide both environmental and economic benefits, and will also have a positive impact on the state of food security.

4. Further gradual increase (on a three-year basis) of environmental tax rates, the funds from the accumulation of which should be directed to finance scientific research and development in the field of reducing greenhouse gas emissions. Thus, in accordance with the Law of Ukraine № 2628-VIII dated November 23, 2018 "On the Tax Code of Ukraine and some other legislative acts of Ukraine regarding the improvement of administration and revision of rates of certain taxes and fees" [297], there was a significant increase in environmental tax rates, which come into effect from 2019, in particular: for carbon dioxide (CO2) emissions from stationary sources from 0.41 UAH/ton to 10 UAH/ton. It is worth noting that until 2014, revenues from the environmental tax were partially credited to a special fund of the state budget, which allowed these financial resources to be directed specifically to the implementation of environmental projects, while today all funds are directed to the general fund, and therefore their targeted use is practically impossible to verify. Given the above, further increases in environmental tax rates, as well as a return to the practice of crediting funds from the environmental tax to a special budget fund (returning to the format of the environmental fee) in order to direct these financial resources specifically to the implementation of environmental initiatives, especially those that contain innovative and scientific components, will contribute to solving environmental problems and improving the state of food security.

5. Development and implementation of a comprehensive concept for the restructuring of the national economy based on its greening. The first and fundamental step in this direction should be a detailed environmental monitoring of the activities of agricultural sector enterprises, assessment of risks, productivity and return on assets of their operation, etc. Based on the results of this stage, a group of enterprises with significant environmental risk should be identified, in respect of which specific regulatory measures should be taken. At the same time, the development strategy of the country's national economic sector should be revised in order to develop specific steps to stimulate the development of more environmentally friendly industries or technologies.

The next block of factors that affect the level of sustainable development of the agricultural sector of the economy is the production, transportation, and consumption of electricity. The increase in electricity production from alternative sources has a stimulating effect on the level of food security, and the loss of electricity during production and transportation has a destructive effect. Therefore, to enhance the positive effect caused by the action of stimulating factors and to neutralize the effects of negative determinants, the following regulatory measures are proposed within this block:

The use of financial and economic instruments (providing tax incentives, preferential lending, targeted budget financing, public-private partnership programs) for the modernization and technical re-equipment of agricultural enterprises based on energy efficiency.

Expanding the scale of the use of agricultural sector waste (biomass) for electricity production through the use of financial, economic, and investment instruments.

According to AgroPolit.com [4], the use of biomass in the energy sector has good prospects for development in Ukraine. In particular, during 2020-2024, bioenergy accounted for 81% of the total volume of renewable energy sources in Ukraine. Overall, in 2023, the share of electricity consumption derived from biomass processing is 3.1% of the total volume of electricity consumption (the potential of wind and solar power plants, as well as hydroelectric power plants, is 0.1% and 0.7%, respectively). However, in the structure of bioenergy, the lion's share is occupied by the processing of specialized technical plantations, while the use of agricultural sector waste for these purposes is practically not carried out. Given this fact, it is advisable to develop this particular segment of bioenergy, since the use of agricultural waste as a source of electricity will simultaneously solve both environmental and energy problems, and will also contribute to a qualitative improvement in agricultural conditions. Thus, it is advisable to introduce financial, economic, and investment instruments to stimulate the development of this segment in Ukraine (allocation of targeted funding for the development of bioenergy, especially from agricultural waste; exemption from income tax for 3 years for enterprises that process agricultural sector waste into electricity; focus of public-private partnership (on the part of state representatives) specifically on projects that process agricultural

sector waste into electricity or provide related services; payment for this type of electricity at an increased "green" tariff, etc.).

Attracting foreign investors to develop alternative energy infrastructure in analogy with a production sharing agreement. Given the need to establish Ukraine's energy independence, the development of alternative energy is one of the important strategic tasks at the current stage of development of the domestic economy (according to the data of the Ukrainian Renewable Energy Association [5], alternative energy is able to replace about 50% of the total domestic energy consumption), however, the development of the infrastructure necessary for the establishment of this sector requires significant initial capital investments. One of the possible ways to implement this task may be the development of public-private partnerships, which would allow sharing the financial burden between the state and one or more private investors. In addition, in this area, it is possible to use a modification of the production sharing agreement. Thus, "according to the production sharing agreement, one party - Ukraine (hereinafter - the state) entrusts the other party - the investor for a specified period to conduct exploration, prospecting and extraction of minerals in a specified area (areas) of subsoil and to conduct work related to the agreement, and the investor undertakes to perform the entrusted work at its own expense and risk with subsequent compensation of costs and receipt of payment (remuneration) in the form of a share of profitable products" [7]. Accordingly, such a mechanism could attract foreign investors to the "green" energy market in Ukraine, and in return receive a share of profitable products. In turn, the restructuring of Ukraine's energy sector by transitioning from traditional to renewable energy sources would improve the country's level of energy independence, improve the state of the environment, and accordingly have a positive impact on the levels of sustainable development of the agricultural sector of the economy and food security as its main target.

4. Gradual decommissioning of energy sector facilities that have the maximum destructive impact on the environment, with the parallel commissioning of new renewable energy facilities (or conversion of existing power plants according to the same principle).

It is also worth noting that the key to effective and sustainable agriculture is the optimal use of land (expansion of arable land) and forest resources. To solve this problem, the following measures are proposed: The use of financial and economic instruments (providing tax incentives, preferential lending, targeted budget financing, public-private partnership programs) for the modernization and technical re-equipment of agricultural enterprises based on the optimization of land use (improving land quality, which in turn will increase their productivity). Increasing the level of afforestation, introducing annual inventory of the forest fund, as well as establishing national annual quotas for logging.

Preventing the reduction of forest areas is an important strategic task, because according to [69], a reduction in net greenhouse gas emissions by the agricultural sector of the economy is projected in the next 10 years precisely due to the forestry segment.

It is worth noting that one of the positive environmental factors is the increase in fertilizer consumption. However, it is fair to note that this process must be controlled and balanced, because excessive use of mineral fertilizers can negatively affect both the quality of land and the environmental friendliness of food products themselves. That is why the following tools are proposed to be used in the context of this vector:

Introduction of scientifically sound technologies for the use of fertilizers.

The development of the agricultural sector of the economy is impossible without the use of both organic and mineral fertilizers, since their use, on the one hand, allows to increase the yield of agricultural crops by 40-50%, and, on the other hand, allows to enrich soils with nutrients and prevent their degradation. However, careless use of mineral fertilizers can significantly impair soil productivity for a long period of time, which is why in the context of ensuring sustainable development of the agricultural sector of the economy, it is important to conduct scientific research that would allow to specify the optimal scales of the use of various kinds of mineral fertilizers, both

in terms of fertility and environmental friendliness. State support for the national segment of mineral fertilizer production with a focus on their less harmful types for the ecosystem. The development and stable functioning of the domestic sector of mineral fertilizer production is an important strategic priority for the development of the national economy for several reasons, namely: 1) Ukraine is a powerful agricultural state, and therefore provides a permanent demand for various mineral fertilizers; 2) the high cost and price volatility of mineral fertilizers in foreign markets poses risks of destabilization for enterprises of the agricultural sector of the economy, and also encourages them to use cheaper, but more harmful for the ecosystem mineral fertilizers; 3) historically, Ukraine specialized in the production of mineral fertilizers, and therefore has good prerequisites for the development of this segment, which, provided modernization and capital investments, will be able not only to meet the needs of the domestic market, but also will have significant export potential.

3. Financing of scientific research and development to determine the proportions of organic and mineral fertilizer use by the agricultural sector of the economy to optimize the "yield-environmental impact" ratio.

Indeed, the concept of organic agriculture is gaining increasing popularity among agricultural enterprises in the global market. On the one hand, it enables the provision of the population with high-quality food products, and on the other hand, it does not cause significant destructive effects on the ecosystem. Primarily, organic agriculture involves the abandonment of mineral fertilizers, pesticides, synthetic growth stimulants, etc., and their replacement with organic analogues. At the same time, this approach is riskier for agricultural enterprises themselves, as it does not guarantee high yields under adverse weather conditions or other unforeseen factors. Thus, an important direction towards ensuring the sustainable development of the agricultural sector of the economy is international cooperation in the implementation of scientific research aimed at determining the permissible and acceptable proportions of organic and mineral fertilizer use by the agricultural sector of the economy to optimize the "yield-environmental impact" ratio. This step will help balance the environmental interests of the state and the economic interests of representatives of the agricultural sector of the economy.

Overall, it is fair to note that achieving sustainable development of the agricultural sector is not a spontaneous or arbitrary process, but requires clear and coordinated actions by the legislative and executive branches of government, as well as the coordinated work of individual ministries and departments. In addition, this process must be structured and implemented according to a clear plan that includes both the identification of key performance indicators (KPIs) defined for this stage and clear time horizons for their achievement. Thus, the tools for implementing agricultural policy through the environmental channel should be developed not spontaneously or in isolation, but based on consideration of: the relevance of environmental determinants that have the strongest impact on the target indicators of the level of sustainability of the agricultural sector of the economy at a specific stage of development of the national economy; the nature of the impact of these relevant environmental factors on food security parameters (stimulators or de-stimulators); and the time lag of the response of agricultural policy KPIs to the action of these factors[12].

Thus, the directions described above and their corresponding instruments for implementing sustainable development of the agricultural sector of the economy have been developed taking into account the relevance criterion, but, as noted above, the formation of tools for managing the sustainable development of the agricultural sector of the economy through the environmental channel should take into account not only the availability of using a particular instrument in the context of the corresponding projection, but also the time lags of the effect of this group of factors on the target indicators of the level of sustainability of the agricultural sector of the economy.Thus, in general, three hierarchical levels of using the tools presented above can be distinguished, which take into account the duration of the time horizon required to obtain the expected results from state interventions, in particular: strategic - the expected effect is achieved with a lag of 4-5 years or under the condition of constant targeted influence (tools aimed at reducing emissions of various types of

greenhouse gases both directly by the agricultural sector of the economy and by other sectors of the national economy; mechanisms for optimizing the use of land and water resources), transitive - the results of regulatory influence are reflected with a delay of at least 2-3 years (tools related to the production, transportation and consumption of energy resources; fertilizer consumption), operational - the regulatory effect is achieved with a minimum lag of 1-2 years (tools for stimulating productivity). Time lags may vary across the target indicators of the level of sustainability of the agricultural sector of the economy, but, as a rule, the difference in the scale of the delay in the manifestation of the effect of environmental determinants on them varies within one year.

Thus, the results of this block of research confirmed the importance of considering environmental factors in the development of a management system for the sustainable development of the agricultural sector of the economy. At the same time, the developed tools for managing the sustainable development of the agricultural sector of the economy take into account the relevance of specific environmental factors for the target indicators of the level of sustainability of the agricultural sector of the economy, the nature of their impact, and the time horizon of their action, and therefore, in general terms, reflect the patterns of development of the agricultural sector of the economy of the 28 post-socialist bloc countries studied and, accordingly, are applicable to Ukraine. The identified areas of targeted influence, as well as specific instruments, the use of which through the environmental channel will improve the state of food security of the analyzed countries both as a whole and in the context of its individual projections, should form the basis for the development of a state concept of sustainable development of the agricultural sector of the economy. In turn, its development and implementation by the relevant authorized bodies of executive power will activate the latent potential for ensuring the sustainability of the development of the agricultural sector of the economy, enhance the positive effect of the influence of explicit environmental drivers of sustainable development, and also neutralize the negative consequences of the action of its environmental inhibitors, and therefore has high theoretical and applied value [9].

Potentially available tools and mechanisms for state regulation of sustainable development of the agricultural sector of the region in terms of economic channel of influence (Table 1).

Table 1. *Instruments for implementing a regional strategy for sustainable development of the agricultural sector of the economy depending on the level of economic potential of the region*

Level of potential	Potentially available tools and mechanisms for state regulation of sustainable development of the agricultural sector of the region
Low	- development and implementation of regional programs to support priority areas in agriculture; - development of investment attractiveness profiles of the ACE taking into account regional characteristics; - improvement of infrastructure (ensuring proper transport connections, organization of reliable storage of agricultural products, etc.); - creation of conditions for preferential lending to enterprises of the agricultural sector of the economy for the purchase of materials, equipment, machinery, etc.; - conducting an advertising campaign to popularize local agricultural producers
Medium	- development of small and medium-sized farms based on the principle of cooperation; - obtaining budget financing for the production of highly competitive and high-quality products; - use of the public-private partnership mechanism; - expansion of sales channels for agricultural products.
High	- increasing exports of agricultural products; - diversification of the sectoral orientation of enterprises; - breeding new varieties of plants and animal breeds; - increasing the social responsibility of business; - stimulating business entities to use energy and resource-saving technologies. - introduction of a full cycle of agricultural production; - development of regional commodity exchanges.

It is fair to say that given the low potential of the economic component of the region's development, local governments need to start with the basic principles of management, namely, the formation of a general concept of supporting possible types of agricultural activity, the development of regional attractive conditions for attracting investment capital, as well as the formation of favorable conditions for attracting loan capital at the expense of regional financial institutions.

Given the average potential of the economic component of the region's agricultural sector, the main instruments of state influence should be aimed at intensifying the development of farming, public-private partnerships, and assisting producers at the regional level with the sale of their products by organizing fairs and, so-called, trading houses.

The high level of potential of the economic component of the agrarian sector of the region requires local governments to use even more active instruments of influence, so the main emphasis should be on the development of innovative directions of conducting agrarian business: new methods of organizing the production process, new types of products, new channels of its sales, new financial intermediaries serving this industry.

Moving on to the analysis of the social component of the development of the region (Table 2), we note that its low level requires the creation of priority conditions for high-quality living of the population in rural areas. The average level of potential of the social component of the development of the region requires regional authorities to direct all efforts to improving the level of qualification of existing personnel in the agricultural sector, as well as training young specialists for areas and branches of agricultural activity that will be relevant in the present and future periods.

Given the high potential of the social component of the agrarian sector of the economy, the efforts of regional authorities should be aimed at stimulating the participation of scientific institutions in the processes of social development of the agrarian sector of the economy. That is, achieving the highest possible level of social development of the agrarian territories of the region is possible only on the condition of scientifically substantiated identification of problematic aspects of a social nature inherent in them and their balanced solution.

Table 2. *Instruments for implementing the regional strategy for sustainable development of the agricultural sector of the economy depending on the level of social potential of the region*

Level of potential	Potentially available tools and mechanisms of state regulation of sustainable development of the agrarian sector of the region
Low	- development and implementation of regional programs to reduce the migration of the economically active population from rural areas to cities or abroad; - improvement of social infrastructure in the countryside; - development of a model of agricultural advisory services.
Medium	- development and implementation of regional programs for professional training and advanced training of workers employed in the agricultural sector of the economy; - training of specialists and experts in vocational and higher educational institutions who meet the needs of regional development.
High	- development and implementation of regional programs for professional training and advanced training of workers employed in the agricultural sector of the economy; - training of specialists and experts in vocational and higher educational institutions who meet the needs of regional development. - conducting scientific research with the participation of regional partners in the agricultural sector.

Concluding the analysis of state influence instruments on the sustainable development of the agricultural sector of the economy, we note that given the low ecological potential of the region, the instruments of influence should be directed at neutralizing the largest polluting agricultural enterprises, as well as restoring land and forest resources. The basic instrument of state influence of an environmental nature, along with the economic channel, is the intensification of the process of attracting investment resources for the re-equipment of production facilities (more environmentally friendly equipment) of agricultural enterprises.

Within the average potential of the environmental component, the main instrument of influence of the authorities should be a program for the development of organic farming with minimal harm to the environment.

Given the high potential of the environmental component of the agricultural sector of the economy, the efforts of regional authorities should be aimed at stimulating the use of alternative energy in the production process, as well as forming a roadmap for the development of agrotourism.

Table 3. *Instruments for implementing a regional strategy for sustainable development of the agricultural sector of the economy depending on the level of the ecological potential of the region*

Level of potential	Potentially available tools and mechanisms of state regulation of sustainable development of the agrarian sector of the region
Low	- optimization of the use of agricultural lands available in the region in order to increase their productivity (use of scientifically substantiated amounts of mineral and organic fertilizers for maximum yield and productive land use); - expansion of the forest fund and control over the rational use of forest resources (implementation of the full cycle of woodworking); - development of regional social advertising to increase public awareness of the negative consequences of greenhouse gas emissions; - formation of a negative image of local enterprises of the agricultural sector of the economy that carry out excessive greenhouse gas emissions, with parallel stimulation through economic instruments of enterprises of the agricultural sector of the economy that do not harm the environment; - search for investment opportunities (in particular, public-private partnership) for the purpose of technical re-equipment of polluting agricultural enterprises in the direction of their greening and energy efficiency.
Medium	- development of small and medium-sized farms operating on the principles of organic farming; - expansion of forest areas and control over the rational use of forest resources (implementation of the full cycle of woodworking).
High	- development and implementation of regional programs for using the potential of alternative energy (especially in the direction of using biomass from the agricultural sector of the economy as a source of energy); - development of agrotourism.

Thus, it is fair to note that the prohibited methodological principles allow for the optimization of the process of state management of sustainable development of the agricultural sector of the economy both at the national and regional levels. Thus, local authorities will have at their disposal a mechanism for achieving the maximum level of sustainable development of the agricultural sector of the economy at a given time based on the existing economic, social and environmental prerequisites for the development of their territory.

It has been established that the process of managing sustainable development of the agricultural sector of the economy should consist of the following stages: analysis and assessment of the basic state of the elements of the managed subsystem (both quantitative indicators of the effective indicators of sustainable development of the agricultural sector of the economy, and quantified relevant environmental, economic, social and institutional determinants that affect them); planning of the potential impact of relevant factors on the effective parameters of sustainable development of the agricultural sector of the economy with the specification of the relevant instruments for achieving target performance indicators; direct implementation of planned measures and control; analysis of deviations of planned values of target indicators of efficiency of sustainable development of the agricultural sector of the economy from their actual values, identification of the causes of discrepancies, adjustment of the vector of the management process of sustainable development of the agricultural sector of the economy taking into account analytical data.

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